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THE TULIP OR YELLOW POPLAR

The American Forestry Association

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Declaration of Principles and Policy of The American Forestry Association

IT IS A VOLUNTARY organization for the inculcation and spread of a forest policy on a scale adequate for our economic needs, and any person is eligible for membership.

IT IS INDEPENDENT, has no official connection with any Federal or State department or policy, and is devoted to a public service conducive to national prosperity.

IT ASSERTS THAT forestry means the propagation and care of forests for the production of timber as a crop; protection of watersheds; utilization of non-agricultural soil; use of forests for public recreation.

IT DECLARES THAT FORESTRY is of immense importance to the people; that the census of 1913 shows our forests annually supply over one and a quarter billion dollars' worth of products; employ 735,000 people; pay \$367,000,000 in wages; cover 550,000,000 acres unsuited for agriculture; regulate the distribution of water; prevent erosion of lands; and are essential to the beauty of the country and the health of the nation.

IT RECOGNIZES THAT forestry is an industry limited by economic conditions; that private owners should be aided and encouraged by investigations, demonstrations, and educational work, since they cannot be expected to practice forestry at a financial loss; that Federal and State governments should undertake scientific forestry upon national and State forest reserves for the benefit of the public.

IT WILL DEVOTE its influence and educational facilities to the development of public thought and knowledge along these practical lines.

It Will Support These Policies

Federal Administration and Management of national forests; adequate appropriations for their care and management; Federal cooperation with the States, especially in forest fire protection.

State Activity by acquirement of forest lands; organization for fire protection; encouragement of forest planting by communal and private owners; non-political departmentally independent forest organization, with liberal appropriations for these purposes.

Forest Fire Protection by Federal, State and fire protective agencies, and its encouragement and extension, individually and by cooperation; without adequate fire protection all other measures for forest crop production will fail.

Forest Planting by Federal and State governments and long-lived corporations and acquirement of waste lands for this purpose; and also planting by private owners, where profitable, and encouragement of natural regeneration.

Forest Taxation Reforms removing unjust burdens from owners of growing timber.

Closer Utilization in logging and manufacturing without loss to owners; aid to lumbermen in achieving this.

Cutting of Mature Timber where and as the domestic market demands it, except on areas maintained for park or scenic purposes, and compensation of forest owners for loss suffered through protection of watersheds, or on behalf of any public interest.

Equal Protection to the lumber industry and to public interests in legislation affecting private timberland operations, recognizing that lumbering is as legitimate and necessary as the forests themselves.

Classification by experts of lands best suited for farming and those best suited for forestry; and liberal national and State appropriations for this work.

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AUTHOR'S INDEX

	Page		Page
Adams, Bristow, article by	866; 935; 987; 1059; 1120	Helms, T. R., article by	1050
Allen, A. A., article by	845; 911; 1047; 1102	Illick, J. S., article by	922
Allen, E. T., poem by	1000	Johnson, H. L., Poem by	1049
Brandreth, Paulina, poem by	976	Levison, J. J., article by	861; 931; 992; 1062; 1114
Buttrick, P. L., article by	896; 960	Mattoon, Wilbur R., article by	1105
Chapman, H. H., article by	981; 1006	Maxwell, Hu, article by	1022
Christine, W. T., article by	1001	Miller, Warren H., article by	916
Detwiler, S. B., article by	957; 1019; 1081	Miller, Wilhelm, article by	969
Drinker, Dr. H. S., article by	851	Mitchell, Guy E., article by	1090
address by	1054	Neumiller, A. C., article by	868
review by	1125	Nevitt, Grace Roper, article by	928
Elliott, S. B., article by	840	Pearson, C. H., article by	1098
Ellis, Don Carlos, article by	1110	Powell, George S., article by	1128
Fischer, Arthur T., article by	997	Prentice, Burr N., article by	930
Gaskill, Alfred, article by	989	Scott, Agnes L., article by	1058
Goodwin, James L., article by	872	Sherfese, W. F., article by	1033
Greeley, W. B., article by	298	Simmons, J. R., article by	990; 1043

GENERAL INDEX

	Page		Page
Alaska's Fire Losses	968	Conventions—See The Directors Meeting: Pennsylvania	
American Chestnut Tree, The—S. B. Detwiler	957	Meeting, A; At the Panama-Pacific Exposition; Di-	
American Forestry Association, Medal for the	1119	rectors Meet in New England; Forestry at the Ex-	
<i>American Forestry</i> ,	1106; 1131	position.	
American Trees in German Forests—J. S. Illick	922	Current Literature:	886; 946; 1009; 1132
Apache National Forest, A Trip on the—A. P. W.	1056	"Cypress Knees," Suggestions for Using—Howard F. Weiss.	1041
Appalachian Park Association, The—George S. Powell	1128	Daniel Boone's "Bar" Tree—Wilbur R. Mattoon	1105
Approved, Forest Service Methods	942	Dead Leaves, Use the	1109
Arborists Will Meet in Newark in January	1065	Departure of the Birds—A. A. Allen	977
Arrow, Huge Natural	1094	Directors Meet in New England	988
Ash, White—Identification and Characteristics—By S. B.		East and the West As the East Hopes to See them, Forest	
Detwiler	1081	Relations Between the—Address by Dr. H. S.	
Association, State Forestry—Editorial	1068	Drinker	1054
Attracting the Winter Birds—A. A. Allen	1102	East, National Forests in the	1003
Audubon Societies, The	1048	Editorial	876; 941; 1003; 1068; 1124
Avalanches, Rock—Guy E. Mitchell	1090	Enlarged Magazine, The	876
Aviator to Detect Forest Fires	914	Evergreens, The Ornamental—Warren H. Miller	916
"Bar" Tree, Daniel Boone's—Wilbur R. Mattoon	1105	Exhibit, The Forest Service—Don Carlos Ellis	1110
Beaver Dams Last 150 Years	1002	Exhibit, The Philippine Forestry—Arthur T. Fischer	997
Biggest Shade Tree is Also Best, The	1008	Exposition, At the Panama-Pacific	913
Bird Department (Department of Magazine)—Edited by		Exposition, Forestry at the	980
A. A. Allen, Ph. D.	845; 911; 977; 1047; 1102	Exposition, Forestry at the	1065
Bird Destruction Costs, What	1089	Finance, A New Factor in Forest—W. T. Christine	1001
Birds and the Forests—A. A. Allen	845	Fire Fighting Exhibit at the Exposition	852
Birds, Our Vanishing Shore—A. A. Allen	911	Fires, Aviator to Detect Forest	914
Blisters Rust Threatens	1122	Forest, A Trip on the Apache National—A. P. W.	1056
Book Reviews: See Reviews, Book.		Forest Conservation, The Problem of—W. B. Greeley	928
Boone's "Bar" Tree, Daniel—Wilbur R. Mattoon	1105	Forest Finance, A New Factor in—W. T. Christine	1001
Boston, Annual Meeting in	1032	Forest Fires, Aviator to Detect	914
British Columbia Notes	885; 946; 1008; 1072; 1132	Forest Lands, Japan's	915
Business Side of Forestry, The—Editorial	1124	Forest Notes: (Department of Magazine) 880; 943; 1070; ..	1129
California Tree Novelties—Part 2—E. A. Sterling	853	Forest Problems, Getting Closer to	1003
California's Tree Collection	991	Forest Relations Between the East and the West As the	
Canadian Department, The (Department of Magazine)—		East Hopes to See them—Address by Dr. H. S.	
Edited by Ellwood Wilson	883; 945; 1007; 1071; 1132	Drinker	1054
Carolina's Action, North	871	Forest Reserves Purchased	879
Characteristics and Seeding of the Tulip Tree—S. B. Elliott.	840	Forest Service Exhibit, The—Don Carlos Ellis	1110
Chestnut in the Future	967	Forest Service Methods Approved	942
Chestnut Tree, The American—S. B. Detwiler	957	Forest, The First Town	1042
Children's Department (Department of Magazine)—Edited		Forests in the East, National	1003
by Bristow Adams	866; 935; 987; 1059; 1120	Forester, West Virginia's State	1002
China, Philippine Lumber for	930	Forestry and What It Means—Bristow Adams	866
China, The Reforestation Movement in—W. F. Sherfese ..	1033	Forestry Associations, State—Editorial	1068
Chugach Forest Reduced	927	Forestry at the Exposition	980; 1065
Cigar-Box Wood is Secured, How—C. H. Pearson	1098	Forestry Class in the Woods, Yale—James L. Goodwin ..	872
Coal Company Practices Forestry—A. C. Neumiller	868	Forestry, Coal Company Practices—A. C. Neumiller	868
Collecting Wood Specimens	844	Forestry, The Business Side of—Editorial	1124
Conference, An Important	908	Forestry Exhibit, The Philippine—Arthur T. Fischer	997
Conserving the Waterfowl—A. A. Allen	1047	Forestry Opportunities, Texas	1106
Constitution, The New York	941	Forestry, The Principles of Landscape—Wilhelm Miller ..	969
Conservation and Waterpowers, National—H. H. Chapman ..	981	Forestry Work, Michigan	1107
Conservation, The Problem of Forest—W. B. Greeley	928	Forests, American Trees in German—J. S. Illick	922

GENERAL INDEX, Continued.

	Page		Page
Forests, Birds and the—A. A. Allen.....	845	Reforestation Movement in China, The—W. F. Sherfese....	1033
Forests, How Switzerland Cultivates Her—Marie Widmer..	847	Relations Between the East and the West as the East Hopes	
Forests in the War Zone.....	909	to See Them, Forest—Address by Dr. H. S. Drinker..	1054
Forty Thousand Get Free Timber.....	991	Reserves Purchased, Forest.....	879
Future, Chestnut in the.....	967	Resolutions, Three.....	1119
German Forests, American Trees in—J. S. Illick.....	922	Review by Dr. H. S. Drinker of Henry J. Pierce's book	
Getting Closer to Forest Problems.....	1003	"Looking Squarely at the Waterpower Problem".....	1125
Gipsy and Browntail Moths, Work Now Against.....	1128	Reviews, Book:	
Growing Pine at a Profit—J. R. Simmons.....	1043	Looking, Squarely at the Waterpower Problem—By J. J.	
Grows, How a Tree—Bristow Adams.....	935	Pierce, reviewed by Dr. Drinker.....	1125
Hawaii, Forest Items from.....	1118	The Zimmerman Pine Moth—By Josef Brunner.....	1130
How a Tree Grows—Bristow Adams.....	935	Rock Avalanches—Guy Elliott Mitchell.....	1090
How Switzerland Cultivates Her Forests—Marie Widmer..	847	Seeding of the Tulip Tree, Characteristics and—S. B. Elliott	840
How Trees Travel—Bristow Adams.....	987	Service Exhibit, The Forest—Don Carlos Ellis.....	1110
Indiana's Forestry Home—Burr N. Prentice.....	930	Service Methods Approved, Forest.....	932
Industries, Maryland's Wood-Using.....	986	Shade Tree is Also Best, The Biggest.....	1108
Japan's Forest Lands.....	915	Shade Trees, Ornamental and (Department of Magazine)—	
Labels on Park Trees, Common-Sense—J. J. Levison.....	1062	Edited by J. J. Levison.....	861; 931; 992; 1062; 1114
Lagan, Logging Rasak and—T. R. Helms.....	1050	Shore Birds, Our Vanishing—A. A. Allen.....	911
Land Speculators Block Settlement.....	1040	Speculators Block Settlement, Land.....	1040
Landscape Forestry, The Principles of—Wilhelm Miller....	969	Sprout Growth of Trees, The—Bristow Adams.....	1059
Largest Trees, The.....	976	State Forester and Maryland Towns Cooperating to Improve	
Leaves, Use the Dead.....	1109	Public Shade Trees.....	1113
Lincoln Highway, Tree Planting Along The—Grace Roper		State Forester, Texas.....	915
Nevitt.....	928	State Forester, West Virginia's.....	1002
Longleaf Pine, The (Identification, Characteristics and Com-		State Forestry Associations—Editorial.....	1068
mercial Uses).....	895	States Get \$850,000 from National Forests.....	990
"Looking Squarely at the Waterpower Problem"—Book by		Sugar Making, Maple.....	1031
Henry J. Pierce reviewed by Dr. H. S. Drinker.....	1125	Sugar Maple, The (Identification and Characteristics)—S.	
Lumber Industry Inquiry, The.....	939	B. Detwiler.....	1019
Lumber Wasted, One Third of Our.....	876	Switzerland Cultivates Her Forests, How—Marie Widmer..	847
Lyman, Chester W.,—Director of the American Forestry		Taxation and Conservation—Editorial.....	1069
Association—photograph.....	1097	Texas' Forestry Opportunities.....	1106
Magazine, The Enlarged.....	876	Texas State Forester.....	915
Maple Sugar Making.....	1031	Three Trees—Bristow Adams.....	1120
Maple, The Sugar (Identification and Characteristics)—By		To A Mountain About to be Lumbered—Poem, by Paulina	
S. B. Detwiler.....	1019	Brandreth.....	976
Maryland Towns Cooperating to Improve Public Shade		Town Forest, The First.....	1042
Trees, State Forester and.....	1113	Travel, How Trees—Bristow Adams.....	987
Maryland's Wood Using Industries.....	986	Tree, Famous.....	1121
Medal for the Association.....	1119	Tree Grows, How a—Bristow Adams.....	935
Meeting, The Directors'.....	865	Tree Planter, A Successful.....	937
Meetings—See Conventions.....		Tree Planting Along the Lincoln Highway—Grace Roper	
Michigan Forestry Work.....	1107	Nevitt.....	928
Michigan, The Situation in—J. H. Chapman.....	1066	Tree Splits Large Rock, Pinon.....	1122
Moths, Works Now Against the Gipsy and Browntail.....	1128	Tree, The American Chestnut—S. B. Detwiler.....	957
National Conservation and Waterpowers—H. H. Chapman..	981	Tree, The Tulip or Yellow Poplar.....	833
National Forest Abolished, A.....	1101	Trees in German Forests, American—J. S. Illick.....	916
National Forest, A Trip on the Apache—A. P. W.....	1056	Trees, Ornamental and Shade (Department of Magazine)—	
National Forests in the East.....	1003	Edited by J. J. Levison.....	861; 931; 992; 1062; 1114
National Forests, States Get \$850,000 From.....	990	Trees, The Sprout Growth of—Bristow Adams.....	1059
National Forests Take in \$2,500,000.....	927	Trees, The Largest.....	976
National Parks, Increase of Tourists in the.....	1113	Trees, Three—Bristow Adams.....	1120
New York Constitution, The.....	941	Trees Travel, How—Bristow Adams.....	987
North Carolina's Action.....	871	Tulip or Yellow Poplar Tree, The.....	833
Oaks, Two Notable—J. R. Simmons.....	990	Tulip Tree, Characteristics and Seeding of the—By S. B.	
One-Third of our Lumber Wasted.....	876	Elliott.....	840
Ornamental and Shade Trees (Department of Magazine)		Uses of Chestnut, Commercial—P. L. Buttrick.....	960
Edited by J. J. Levison.....	861; 931; 992; 1062; 1114	War Zone, Forests in the.....	909
Ornamental Evergreens, The—Warren H. Miller.....	916	Wasted, One Third of our Lumber.....	876
Our Vanishing Shore Birds—A. A. Allen.....	911	Waterfowl, Conserving the—A. A. Allen.....	1047
Park Improvements, Yosemite.....	1127	Waterpower Problem "Looking Squarely at the—Book by	
Parks and the Public—J. J. Levison.....	1114	Henry J. Pierce reviewed by Dr. H. S. Drinker.....	1125
Parks, Increase of Tourists in the National.....	1113	Waterpowers, National Conservation and—H. H. Chapman..	981
Philippine Forestry Exhibit, The—Arthur T. Fischer.....	997	Weeks Law Conference, The.....	1004
Philippine Lumber for China.....	930	West, Danger Season in the.....	871
Fine at a Profit, Growing—J. R. Simmons.....	1043	West Virginia's State Forester.....	1002
Pine at Unusual Altitude, Giant.....	1053	White Ash—Identification and Characteristics—By S. S.	
Pine, The Longleaf (Identification Characteristics and Com-		Detwiler.....	1081
mercial Uses).....	895	White Pine Threatened.....	1122
Pine Threatened, White.....	1122	Whittier's Pine Tree—Agnes L. Scott.....	1058
Pine Tree, Whittier's—Agnes L. Scott.....	1058	Winter Birds, Attracting the—A. A. Allen.....	1102
Pinon Tree Splits Large Rock.....	1122	Wood is Secured, How Cigar-Box—C. H. Pearson.....	1098
Planting Along the Lincoln Highway, Tree—Grace Roper		Wood Preserving Department (Department of Magazine)—	
Nevitt.....	928	Edited by E. A. Sterling.....	878; 937; 999; 1061; 1123
Poems.....	976; 1000; 1049	Wood Pulp in Argentina.....	968
Poplar Tree, The Tulip or Yellow.....	833	Wood Specimens, Collecting.....	844
Practices Forestry, Coal Company—A. C. Neumiller.....	868	Woodlot Values Worth Investigating.....	938
Problems, Getting Closer to Forest.....	1003	Woods, Yale Forestry Class in the—James L. Goodwin....	872
Protecting Redwoods.....	929	Yale Forestry Class in the Woods—James L. Goodwin....	872
Public, Parks and the—J. J. Levison.....	1114	Yellow Poplar Tree, The Tulip or.....	833
Purchased, Forest Reserves.....	879	Yosemite Park Improvements.....	1127
Quincy, Mr. Charles Frederick—Director of the American		Sterling, E. A., article by.....	853; 878; 999; 1061; 1123
Forestry Association—photograph.....	851	Weiss, Howard F., article by.....	1041
Rasak and Lagan, Logging—T. R. Helms.....	1050	Widmer, Marie, article by.....	847
Redwoods, Protecting.....	929		

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The Tulip or Yellow Poplar Tree

A General Description for Identification

THE tulip tree, also erroneously called tulip poplar and yellow poplar, is a large, handsome tree, native of the Eastern United States from northern Florida to Massachusetts and the Great Lakes westward beyond the Mississippi.

It grows to a height of 80 feet in the open and in a forest to a height of 120 feet, with a tall, straight, unbranched trunk. Its branches are comparatively few and large. The lower ones frequently branch at right angles from the trunk and then turn abruptly upward. Its bark is dark, mottled with gray spots, smooth with shallow lines.

Its leaves are markedly different from all others, and once recognized will never be confused with any other.

Various Names

Tulip tree,	Whitewood.
Yellow Poplar,	Tulip Poplar,
White Poplar,	Hickory Poplar,
Blue Poplar,	Popple,
Cucumber tree,	Canoe-wood,
Old Wife's Shirt tree,	Saddle-wood.

It appears as though half of the leaf were cut away by cutting the apex off, leaving the remaining portion notched. At each side also is a sharp lobe. This makes an angular leaf having four points and where the apex should be there is an indentation. The leaves are pale green or yellowish green, nearly alike on both sides and when fully developed they have a tremulous motion. In early autumn they turn bright yellow.

The name of the tree is suggested by its conspicuous flowers that come soon after the leaves. They are tulip shaped, greenish yellow, with darker yellow and deep orange on the tip of the petals. As they are borne on stout stems they stand erect above the foliage and are conspicuous against the pale green background. When in full bloom these trees are showy and attractive. The flowers are complete and perfect. The fruit is a cone containing thin narrow scales attached to a common axis. Each scale has a seed attached to a thin membranous wing. They begin to ripen in October and one by one as they ripen they blow out, leaving the outside or lower

scales appearing like an empty pod. By early winter the seeds are all gone, but the empty scales remain erect on the tree all winter, giving an easy means of winter identification.

The tulip is one of our handsomest shade trees, being symmetrical when young and maintaining its symmetry



TULIP OR YELLOW POPLAR LEAF

The leaf is quite different from all others and when once recognized is never confused with any other. It is angular, has four points, a sharp lobe on each side, and where the apex should be there is a sharp indentation.

well. A mature tree is imposing from its size and apparent strength of parts. The foliage is of pleasing color and form. It thrives best on rich, deep soils. Although successful for street planting as a young tree on deep soil in suburban conditions, it does not succeed so well on narrow streets, or where surrounded by much asphalt and concrete. Under these conditions it is apt to drop many leaves all through the season.

Though comparatively free from serious insect pests, it is subject to the tulip tree spot gall. These are brown spots covering the leaves in midsummer, causing the leaves to have an unhealthy appearance.

The tulip is the sole survivor of a group of plants plentiful in past ages. It is, however, closely related to



BARK OF THE TULIP OR YELLOW POPLAR

the Magnolias which it resembles in many of its characteristics. It has the same fleshy roots that make it hard to transplant. These roots are easily bruised and dry quickly when out of the ground. Therefore, they require special care in handling. They can only be suc-

cessfully transplanted in spring, and earliness is an important factor. Success is much more likely in sizes under 6 feet. Because of their rapidity of growth, little is gained by attempting larger sizes. If in transplanting the top should die and the root should put out a vigorous shoot, it is usually better to make a new top from that shoot than to plant a new tree.

In transplanting extra pains should be taken to perform each operation carefully. In digging the tree all the roots should be secured without bruising. As the roots are large and fleshy, this takes extra care. Then too extra care is needed to keep the roots from drying out. They should be kept continually covered with wet burlap and should be packed in wet moss or chaff when shipped. In taking to the planting place the roots should be kept thoroughly protected. The hole should be made considerably larger than the spread of the roots and 2 feet deep. This hole should then be filled with good top soil thoroughly mixed with well rotted manure and ground bone. If the hole has a capacity of 2 or 3 cubic yards the tree will be given an excellent start. If planted on a street the hole should under no circumstances be smaller than this. When the hole is prepared, the tree should be set an inch or two deeper than it stood in the nursery. The roots should be spread out in their natural position and be separated with layers of soil. After being well covered they should be thoroughly tramped and a little loose soil spread over the surface.

The wood is soft, fine grained, with light yellow heartwood and white sapwood. It is light in weight, easily worked, readily bent and does not split easily. It is called poplar and tulip poplar in the East and whitewood in the West, though whitewood is a name also given to basswood. Other names are Lynn, or saddle tree, hickory-poplar, saddle-leaf, canoe-wood.

It is used for furniture, cabinet making, interior finishing, boat building, wooden ware and small articles of household use. Where a wood is wanted that will not impart taste or odor to food it is second choice, basswood being first.

Commercial Uses of Tulip or Yellow Poplar

OUR lumbermen, as well as many others interested in the tulip tree, have not been content to call our tree by its correct name, but quite generally have bestowed upon it that of yellow poplar. No doubt they have given it this name because its individual leaves, like those of the true poplars, flutter in a gentle breeze—its leaf stem, being triangular, causes it to vibrate in the wind, as does the flat one of the poplars—and because the color of the heartwood, in most cases, is somewhat yellow, hence the prefix "yellow" was attached, making it yellow poplar, to distinguish it from the wood of the genuine poplars which is white.

Then, again, because its bark, when the tree is small and thrifty, closely resembles that of a young and vigorous hickory and the wood in young trees is harder than in mature ones, it is called hickory poplar by some. Where the heartwood is white, as is the case in some localities—arising, probably, from soil or climatic conditions—it has been called whitewood; and, further, for the reason that the Indians made their long and large canoes from the straight, but slightly tapering stem, which was soft, easily worked, and light, others have given it the name of canoe-wood. A few other names have been given it, but among them all only tulip tree is appropriate, and that is eminently so because of the



OUTLINE OF LEAF, BUD AND FLOWER OF TULIP OR YELLOW POPLAR TREE

The flowers are tulip-shaped, greenish-yellow, with darker yellow and deep orange on the tip of the petals. They grow on stout stems that stand erect above the foliage and are complete and perfect.

close resemblance of its flowers in form to that of the tulip of our flower gardens; and, besides that, tulip tree is the scientific or botanical name also.

But the lumbermen of the country have fixed upon yellow poplar and there is no more prospect of its name being changed by them than there is in their calling liquidambar by its correct name instead of designating it red gum, when it is no more a gum than is the tulip tree a poplar. In this portion of the article on tulip it will be referred to as the yellow poplar—the lumberman's name for it.

Aside from the great sugar pine, or redwood, of the Pacific slope, there is no tree from which the lumberman can secure such broad boards and planks of clear stuff that have so great an economic value for so many purposes, and which is so close to the wood of the white pine in character and general utility, as he can get out of the mature yellow poplar, and for many purposes it is fully equal to the pine. It is true it is not so soft or so strong, or so easily worked, nor is it as durable when exposed to the weather, but it shrinks little when seasoning, does not warp, "stays in its place," as the workman says, does not split when a nail is driven near the end, takes glue and stain well, and actually presents a better surface for paint than pine, for it has no pitch to stain or disfigure the paint, and, because of a slight roughness of the surface, paint does not scale or peel off. In fact it is one of the best paint-holding woods in commercial

use. It has no odor or offensive smell to injure any article that may be enclosed in a receptacle made from it.

But the big trees have their drawback. The wood in these is brittle and unless great care is taken in felling them—and such care does not always insure success—such trees will break when striking the ground. Of course the chopper will select, if possible, some less valuable tree to fall his big yellow poplar against, thus converting the poorer one into a sort of buffer, but it is generally done to the more or less damage of the innocent tree selected, and both may be more or less injured. Great care should be taken in felling large trees that they do not strike stumps or logs, for if they do they are almost certain to break, and, frequently, in more than one place.

The quantity of yellow poplar in the forests before the first settlers disturbed it, and the quantity still remaining, are not known. Experienced lumbermen who buy and sell stumpage figure that for uncultured woods a yellow poplar stand of 1,000 feet to the acre is a good average. Assuming that to have been the average before lumbermen and settlers disturbed it, and assuming further that the region of good poplar covered 300,000 square miles, the total stumpage was about 190 billion feet. Compared with that, the remaining amount is small. The region north of the Ohio River, and States north of



By courtesy the Manual Arts Press

AREA OF TULIP OR YELLOW POPLAR

Showing the States in which it grows. Most of the trees cut and made into lumber during the past few years have been from West Virginia, Tennessee and Kentucky, these States furnishing more than half of the total cut.

West Virginia, have little. The bulk of it is in West Virginia, Kentucky and Tennessee. They furnished over one-half of the total cut in 1913, and Virginia alone nearly one-fourth. If it be assumed that the cut in a State is in proportion to the quantity growing there, a basis is found on which to estimate, approximately, the country's total stumpage. An estimate of Kentucky's yellow poplar stumpage in 1908 placed it at 1,849,950,000 feet. The cut



By courtesy The Manual Arts Press

YELLOW POPLAR BOARDS

Tangential or bastard cut section of yellow poplar, showing annual growth rings as wavy lines, referred to commercially as grain.

Radial or quarter sawed section of yellow poplar, showing pith rays (streaks and flecks running across board). Dark portion is heartwood and light portion sapwood.

in that State in 1907 was 205,671,000 feet, or about 11 per cent of the stand. In that year the whole country's cut of yellow poplar was 862,849,000 feet. If the same ratio of cut to stumpage applies, as in Kentucky, the yellow poplar stand in the United States at the close of 1907 was a little less than eight billion feet.

What white pine has been in the softwood lumber industry, yellow poplar has been among the hardwoods. While it was plentiful it was used to the exclusion of many others. During the time when both white pine and yellow poplar were plentiful they came into direct competition, and the pine crowded poplar out of some lines. But the former rose in price first, and poplar recovered its lost ground and held it until cheaper woods took its place as a common lumber.

In regions where yellow poplar grew it was early put to such uses as the first settlers could find for it. They made canoes of it almost exclusively, and the dugout played an important part in frontier development. Travelers utilized it upon

Properties of Wood

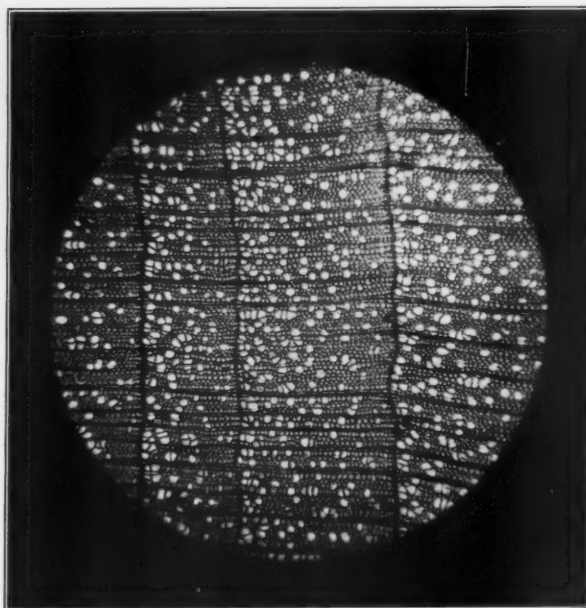
Light, soft, weak, brittle, very close, straight-grained, compact, easily worked, medullary rays numerous, not prominent; color light yellow or brown, thin sapwood, nearly white.

ers utilized it upon long and short journeys. It was the pioneer's ferryboat. As a means of extending settlements and facilitating communication, it was a close second to the pack-horse. It went out of use gradually as roads were

made and bridges built, but to this day the canoe is occasionally seen on the rivers where it has done service since white men settled the country, and where it was the Indian's water-craft long before.

Yellow poplar was peculiarly fitted for canoes. Its trunk was long, sound and shapely; the wood light and easily worked. It was strong enough to stand the hard knocks of rocky rivers; sufficiently durable to give from ten to thirty years' service, barring accidents. The cost in labor of making a canoe was from \$2 to \$5. A safe load was from 600 to 1,000 pounds, but records exist of canoes large enough to carry twenty men.

The early settlers used yellow poplar for troughs of various kinds and sizes. In that portion of its range where maple sugar was made, its wood was hewed into



By courtesy The Manual Arts Press

MAGNIFIED CROSS-SECTION OF YELLOW POPLAR

This shows the annual rings, the fine dark lines marking the limit of the annual growth. There is no change in structure by warping or shrinking in wood which has been properly dried.

troughs of 4 to 6 gallons capacity, to catch the sap that dripped from the maples. Trough makers preferred trees 12 to 18 inches in diameter for the purpose, but they made large troughs, sometimes of 15 barrels capacity, in which to store the maple sap after it was hauled to the camp to be boiled. Poplar served for other farm troughs, including those for watering stock, storing meat, grain, soap, and other domestic products, and for mangers and feeding troughs. The same wood served for trays, dishes and bowls and was fitted for that use, because the wood is odorless, tasteless and will not stain or spoil articles of food brought in contact with it.

Commercial Range

Alabama,	Mississippi,
Arkansas,	Missouri,
Delaware,	New Jersey,
Florida,	North Carolina,
Georgia,	Ohio,
Indiana,	Pennsylvania,
Illinois,	South Carolina,
Kentucky,	Tennessee,
Louisiana,	Virginia,
Maryland,	West Virginia.



YELLOW POPLAR AS A VENEER

Here is shown a particularly fine specimen of rotary cut yellow poplar veneer, one-eighth of an inch thick, 10 feet wide and 30 feet long. It is to be used as a ceiling panel for an electric street railway car.

Builders of log houses and barns used some yellow poplar, but it was not considered better than many other timbers for that purpose. Its straight trunk was attractive, but oak was usually most convenient and was oftener taken. Nor was poplar a favorite fence rail material, though sometimes used. It was too brittle, and in splitting was apt to break across the grain. Oak and chestnut were better. It was due to that fact that many noble poplars remained on the borders of farmlands until the days of sawmills. The wood was never extensively used as fuel. If in small pieces, it burns too quickly; if in large billets, there is little blaze after the surface becomes charred.

It has held its place for nearly three centuries as the favorite wood for tobacco hogsheads. Before the days of railroads and steamboats, and to some extent, after, tobacco trade and transportation were peculiar. The commodity was bulky, and its carriage from the plantation to the wharf or market was a serious problem. The necessities of the case developed the hogshead as the receptacle for storing and vehicle of transportation. It was rolled to market between two shafts, fixed by pivots like the wheel of a wheelbarrow. A horse harnessed between the shafts did the work. The warehouse in Maryland and Virginia was a "rolling house," known almost exclusively by that name in colonial statutes and trade literature.

Yellow poplar, as the tobacco hogshead wood, played an important part in the industrial development of several States. Heads and staves were poplar, but the hoops were usually oak or hickory. In early times the lumber was sawed and worked by hand, but small sawmills gradually came in and supplied the trade. The custom of selling tobacco often necessitated knocking down and setting up the hogsheads a number of times, and they met hard usage. At the place of sale, the hoops were cut, and the staves lifted away to expose the tobacco to view. If not sold, the hogshead was set up again to await the next sale day. This was repeated until a sale was made. The same staves and headings were used each time, but new hoops were required.

Before high prices barred it, poplar was employed in rough construction. Shingles lasted well, and laths were extensively used. Forty or fifty years ago carpenters preferred it for rafters, joists, plates, and upper portions of houses because it was light. Many old houses, particularly in New York and Pennsylvania, were made that way. Oak, walnut, chestnut, locust or some other timber considered more durable in damp situations went into sleepers, sills, floors near the ground, and foundations. In those days carpenters often used larger and more numerous timbers than durability and safety required,

and they put the light wood above to lessen the weight on the lower parts.

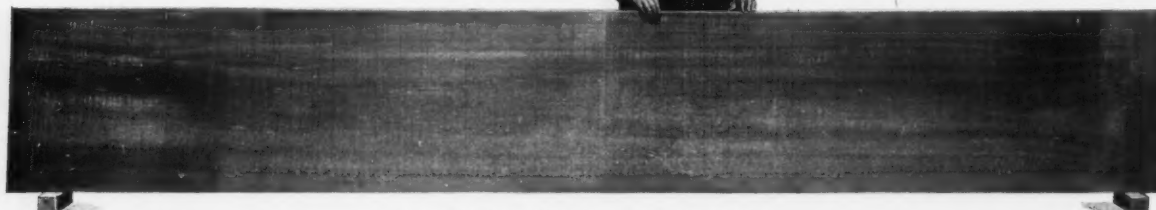
MANUFACTURE OF YELLOW POPLAR

The drain upon yellow poplar began when sawmills sought, cut and sold it to meet the popular demand. No exact time can be mentioned as the commencement of that trade, but it followed white pine in regions where both grew because builders preferred pine.

Yellow poplar is surpassed in size by no eastern tree, and this has been one of its chief advantages in holding its ground in competition with cheaper lumber. It yields the longest, clearest planks of all American hardwoods. This is due to its habits of growth. It goes straight up

became so great that he could not command the capital to carry on the business, wealthy companies took it up. They bought tracts or stumpage, built railroads and mills and worked on a large scale. Some made a specialty of yellow poplar; others took it out with other kinds. Perhaps more culling from other timber has been done to procure poplar than any other wood except black walnut.

Size of planks is not the only property which commends yellow poplar to many uses. It is soft and easily worked; it is light; its color is handsome; it polishes nicely, does not warp



A TYPICAL YELLOW POPLAR BOARD

This is 16 feet long and 30 inches wide and was made from timber cut in the low Appalachian Mountains. The picture was furnished by Mr. F. S. Underhill, of Wistar, Underhill & Nixon, of Philadelphia, and was taken in the firm's lumber yard at Basic City.

to the light over the tops of other trees with which it is associated, and early in life gets rid of all unnecessary branches. The wood laid on year by year is clear of knots, or nearly so. The tree is seriously damaged by no insect pests, and is remarkably free from windshake and frost cracks. Though sensitive to fire, its preference for damp cover has in a measure saved it from injury, because forest fires are slow there. The logs are sawed in wide, first-class stuff, which goes to choice markets. Boards 18 inches wide are not unusual with mills making a specialty of poplar, and twice that width and more are occasionally put on markets which demand them.

Sometimes a yellow poplar, by reason of growing in unfavorable soil, develops peculiarities of wood, and lumbermen call it white or hickory poplar. The wood is coarse-grained, tough, decays quickly, and the trunk is largely sapwood.

The first lumber operations which handled yellow poplar were on a small scale. Farmers cut convenient trees and hauled or rafted the logs to the mills, satisfied if they made a little more than cost of labor, and continuing until the convenient supply was exhausted. Then the small lumberman entered the woods. He went farther back from the streams and bought stumpage, and delivered the logs. After convenient supplies were worked out and distance to the timber

or shrink badly, and holds nails well. But equal or superior to its other good qualities is its ability to hold paint. In that respect it stands in the very first rank of woods. Poplar does not need repainting often, and it holds the finest and the cheapest pigments. It is an ideal wood for bodies of sleighs, carriages, and automobiles, and for finish for steamer staterooms, cabins and interior finish of sleeping cars, where high-class painting is required. It is dented less easily than sheet metal, and many prefer it for panels. That is one of its uses from which high price has not been able to drive it.

Where cheaper paints are employed, it serves equally well; in weatherboarding, for example. In 1902, the H. C. Frick Coke Co., at Mount Pleasant, Pa., tore down an old grist mill whose yellow poplar siding was sound and bright though repainted but once in fifty-three years. Poplar siding that had served more than sixty years at Evansville, Ind., was again used on a new house.

Increased cost of poplar has retired it from some of the ground once held in the box trade, particularly boxes for shipping lard, starch, butter and similar commodities, which boxes, a generation ago, were often made with bottom, side and top each a single piece. Poplar

Principal Uses

Sash Doors and Blinds;	Store and Office Fixtures;
General Mill Work;	Furniture;
Tobacco Hogsheads;	Agricultural Implements;
Packing Boxes;	Billiard Tables; Hidden Work;
Candy Boxes;	Picture Frames;
Cigar Boxes;	Mantles;
Tobacco Boxes; Pyrography;	Matches and Toothpicks;
Toys and Novelties;	Desks, Pianos and Organs;
Kitchen Utensils;	Trunks, Posts and Columns;
Bungs and Faucets;	Veneer, Coffins and Caskets;
Fruit and Berry Crates;	Pressed Pulp Ware;
Wagon Beds and Vehicle Panels;	Papier Maché, Excelsior;
Car Finish; Boats;	Artificial Silk.



YELLOW POPLAR USED IN AN ORGAN FACTORY

In this industry woods which are least liable to warp are desired and for this reason yellow poplar is highly prized for use in the manufacture of wind chests, bellows and other similar parts. The steadily advancing price is, however, compelling manufacturers to look for a satisfactory substitute.

was preferred for this trade, because it left no taint on the enclosed articles. Confectioners continue its use for candy boxes, and it is a substitute for expensive cedar in cigar boxes. It is in demand for pyrography, and toy and novelty makers draw largely upon it for sleds, wagons, blocks, houses, games, and similar things for children, and for such useful articles as broom handles and small kitchen and pantry utensils, and for fruit and berry crates and baskets.

Most wagon beds were formerly made of it, and many still are, in spite of increased cost. A difference of eight or ten dollars a thousand feet is paid for poplar for that purpose. It does not easily warp or split, and is light, with good painting qualities—just what is wanted for wagon bodies. In laboratory tests of woods for this use, yellow poplar is taken as the basis of comparison for cross-breaking, abrasion, shearing and end-compression. In this line, cottonwood is the poplar's closest competitor, not because it is as good, but because it is fairly good and is cheaper. For small panel work, poplar's closest competitors are buckeye, gum and basswood. Boat building formerly absorbed much poplar, but less now, because of increased cost.

It has long been a favorite material for furniture, though for highest grades it is not in the same class with mahogany, cherry, walnut and maple. Its paint-holding qualities, and the polish which may be given it, have led to its use in imitation of more costly woods,

and the width of clear stuff which poplar supplies gives it an advantage in furniture making. Billiard table makers use some of the best. The list of articles of furniture and finish into which it enters would include almost every piece in a well-furnished residence, school, office, or church, including chairs, mantels, benches, desks, tables, bedsteads, pianos, organs, bookshelves, trunks, molding, paneling, porchwork, turned posts, columns, shelves and many more. In some of these it is the outside exposed material which receives the polish or paint; in others it is the framework over which other woods are laid. It is an excellent backing for veneer, because it retains its shape and holds glue well, and is also an excellent veneer in the highest grade work, such as the interior of palace cars and steamers. Broad, thin panels are bent to the required form. They are sometimes made up of two or three layers glued together, and occasionally are 2 feet wide, or more. Bent poplar has been much used for finish in circular rooms. Manufacturers claim that the best grades for fine veneering and finish come from West Virginia. The sap is thinner and the grain finer than in poplar farther south.

The pattern maker bases his preference for poplar upon its easy-working properties, and its rigidity. Cheaper woods have not lessened its use for that purpose. The coffin and casket makers, too, are slow to adopt substitutes for it in their trade, and the excelsior maker finds it good material in his line.

Yellow poplar is exported to nearly all civilized countries. Practically the world's whole supply comes from the United States, and regular shipments go to Great Britain, France, Germany, Sweden, South America, South Africa, West Indies, Mexico, and Central America. Export logs are usually 8 to 16 feet long, but planks form the bulk of foreign shipments. If thin pieces go, they are cleated or bound in bundles to lessen risk of damage. Very thin and very wide pieces find foreign sale at highest prices.

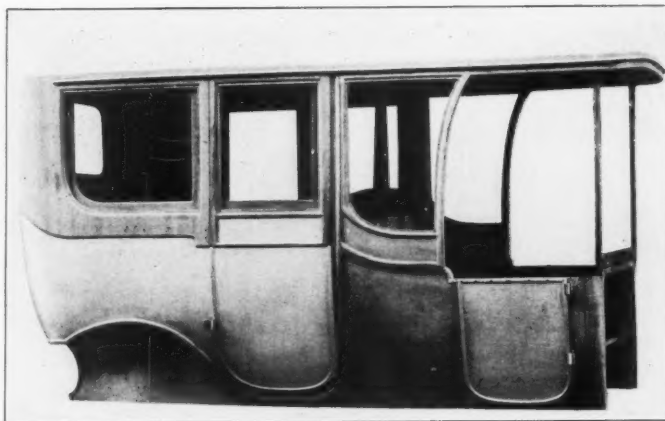
Yellow poplar is well adapted to preservative treatment, but it has not been extensively used in that way because cheaper woods take its place.

THE BY-PRODUCTS

Yellow poplar is not much employed in distillation, and its by-products along that line do not figure largely in commerce. The bark contains a bitter principle, known as *liriodendron*, which has been used as a medicine for malaria since the days of the Indian doctors. It is not regarded as the equal of quinine. In the mountain regions where yellow poplar grows, the people make medicine by pounding the bark, mixing it with dogwood bark, and soaking the mixture in water eight days. Some claim that whisky is a more efficacious solvent, and the mountaineers prefer it. The mixture

is given as a remedy for rheumatism as well as for intermittent fevers.

Yellow poplar enters into the manufacture of pulp and is used in paper-making, pressed pulp ware, papier maché, and artificial silk.



FOR AUTOMOBILE LIMOUSINES

This shows the metal covering of yellow poplar, which is much in demand for this kind of work and is also used extensively for wagon bodies.

[AMERICAN FORESTRY is indebted to the United States Forest Service, Office of Industrial Investigations, for much of the information contained in this article on commercial uses of yellow poplar.]

Characteristics and Seeding of the Tulip Tree

By S. B. ELLIOTT

AWAY back in the dim past, millions of years ago it must have been, for it was in what is geologically known as the Cretaceous and Tertiary ages, there grew several species of trees which were closely allied, if not the actual progenitors, to two species now to be found growing on our planet. The remains of these ancient trees can be seen in some of the rocks of the periods named, and they make clear to us what Elpenor enjoined Ulysses to provide for him; that is, a record that they "had lived." Botanists have given our modern species the name of *Liriodendron*, a term composed of two Greek words meaning tulip tree in our vernacular, and have likewise added the Latin affix *tulipifera*—which has the same meaning as the Greek name—rendering its full technical name *Liriodendron tulipifera*. One of these modern species is indigenous to China and the other to that part of the United States bounded by a line drawn from central New York to Michigan on the north, and the Gulf of Mexico on the south, and from some two or three hundred miles west of the Mississippi River on the west to the Atlantic Ocean on the east.

While it was found, here and there, over a large part of the territory indicated as its natural range it was rarely, or never beyond a few acres in extent, found in a pure stand. It grew along with oaks, chestnut, hickories, cherry, ash, maple, and other broad-leaf trees, but

seldom with hemlock and pine as near neighbors. It was to be seen in its greatest abundance and in its best development along the valleys of the Ohio River and its tributaries, and on the slopes of those valleys and on the slopes and crests of the Appalachian Mountains.

Of all the broad-leaf trees of the United States none attains its grandeur and magnificence of form or vies with it in length, uniformity, or symmetry of stem; and only the sycamore can compete successfully with it in diameter, while that tree utterly fails to equal it in all other attributes of greatness or economic value. It was not unusual, and it may be so still, to find trees 6 to 8 and even 10 feet in diameter, with a stem clean of limbs for 80 to 90 feet and a crown of foliage reaching at the apex 150 or even 200 feet from the ground.

Except in its infancy it is emphatically light-demanding, or, as the foresters say, an "intolerant" tree. When grown in the open it will then throw out limbs close to the ground and assume a rounded sort of a crown with many specialized limbs reaching out from the center a distance equal to fully one-half the height of the tree; but if grown in a dense stand, or in a stand approximating such a condition, with competitors for light at all equal to it in rapidity of growth, it will shoot up a sharp-pointed conical crown, drop all its lower limbs for



YELLOW POPLAR IN THE EXCELSIOR INDUSTRY

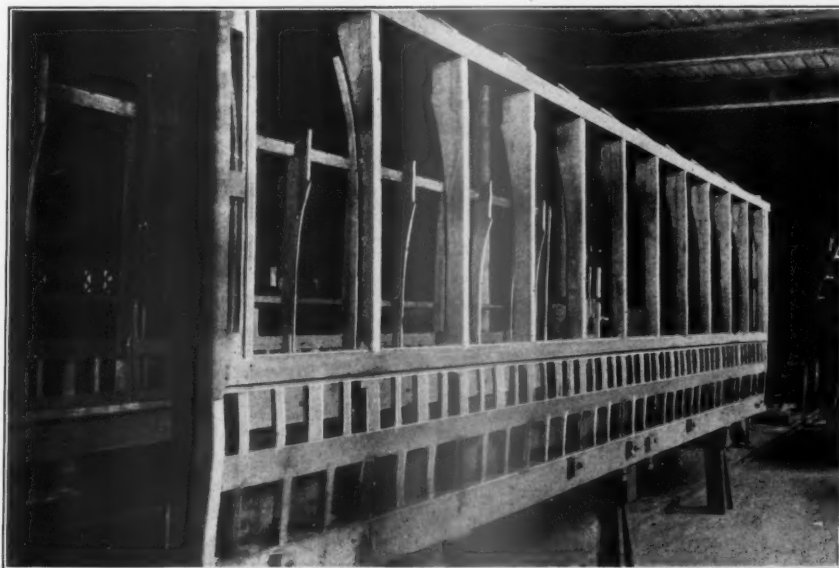
This wood is eighth in importance in the making of excelsior. The picture shows various grades of the product ready for baling.

want of light, and grow a straight, tall, slightly tapering stem with few or no limbs on its lower half. If it fairly outstrips its competitors in the race for light, it will then send out specialized limbs above these competitors' heads and the leader will lessen in rapidity of growth until the large limbs become enveloped in the shade of its persistent companions, when it will again shoot upward leaving the large limbs to their fate, which is generally that of death; and these dying and dropping off give fungi access to the wood and decay in the stem sets in. There is seldom any decay in the stem unless brought about by such conditions. It has no known insect enemies, and appears to be free from attacks of any sort of fungi except as noted. So insistent is it for light after its babyhood, that when grown in the open, and largely so when grown in a dense stand, the leaves will nearly all be found on or near the outer ends of the limbs, leaving the interior of the crown practically destitute of them.

The tulip tree is a prolific seed-bearer. When grown in the open it frequently bears

seed when only twelve or thirteen years old, and when grown in a dense stand, if not too closely crowded by competitors, at from twenty to twenty-five years of age. Of course the younger trees do not bear a heavy crop at first, but it rapidly increases with age. The fruit is practically a scaly cone and the small seed is enclosed in a hard, woody receptacle in the base of the scale. The seeds ripen about the middle of autumn, varying according to latitude and locality, and the seed scales soon begin to drop off, and, as they have a sort of wing about 2 inches long and a little over one-quarter of an inch wide, they can be blown quite a distance by a moderate wind. As there is a gyrating motion given to the wing when it falls the seed may land several feet beyond the extreme ends of the branches, even

though there is no wind at the time. The seeds do not all fall at once, as do those of the pine, but some remain attached to the central cone for a more or less period of time, thus giving the changing winds an opportunity to scatter them in every direction. The central part of the cone does not drop off until the following spring, and even up to that time there may be some of the outer scales still attached.



STREET CAR CONSTRUCTION

Showing the ash or oak frame of an electric street railway car, with process of manufacture at the point at which the frame is ready for the yellow poplar siding and inside paneling.



YELLOW POPLAR FOR STORE AND OFFICE FIXTURES

The wood is very satisfactory and much in demand for all backing and hidden work in the manufacture of store and office fixtures. This illustration shows a set of tier bins for use in a large grocery.

Unfortunately, but few of the seeds are fertile. No one of our useful timber trees has so low a percentage of fertility in its seed as the tulip tree. Old trees are said to give a higher percentage of fertile seeds than young ones, but even these cannot be counted on for a higher rate of fertility than 10 per cent at best. In fact, it is not safe to count on over 5 per cent producing a plant.

As must be seen, this lack of fertility in the seeds in a veritable "lion in the path" of both natural and artificial propagation. Nor is that the only difficulty that must be encountered and overcome. If the seeds, by any means, whether gathered and stored or left lying on the ground, shall become dry to any great extent, they will either fail to germinate or prolong that event for a year, but more frequently the former. If artificial propagation is undertaken the seeds should be gathered as soon as ripe and either planted in the seed-bed at once—which would be best—or stored in damp sand until spring, but not allowed to become mouldy. Placing them where they will freeze will be an advantage as tending to soften the hard shell enclosing the small seed. If a long, dry fall occurs and the seeds that fall on the ground become dry, little natural regeneration can result.

But this lack of fertility in the seeds, or their failing to germinate through becoming dry, is not the only trouble which will be encountered in artificial reproduction. While germination in the seed-bed may occur and the plants grow well under lath screens for the first year and reach a height of from 5 to 10 inches, the seedlings should no longer be allowed to stay there but be removed to the transplant bed or to the ground where they are to grow to maturity—far the best to the transplant bed, however, for there they will get their root development

greatly strengthened and will be better able to withstand the adverse conditions which they will encounter in the forest plantation—for at best there are but few fibrous roots and these are fleshy, soft, and easily broken. Transplanting directly from the seed-bed to the forest is seldom successful.

Although the seedlings may safely be removed to the transplant bed and there make a good growth, the liability of failure to live or thrive when removed to the place where they are to grow to maturity, is still another danger to be encountered. As has been indicated, the tree must be classed as emphatically light-demanding, but this strong demand for light does not appear to prevail for the first few years of its life, just how many is not known. Observation shows that if the seeds are sown and germinate among briars and low shrubs the plants will thrive and make great headway in overcoming their worthless companions, and almost invariably succeed; and it is among such surroundings that nearly all natural reproduction takes place, but if by any means the seeds are sown and germinate on bare, naked ground where the sun can pour down on them all day long, the young plants do not thrive as well, if they grow at all, as when growing in the shade which the low bushes and briars afford them. A case occurred under the writer's observation where an open field—on which grew only grass and a few insignificant weeds of little height—was bordered on one end and along its two sides by virgin forests that, at times, cast a shadow over a border of the field, varying from 50 to 100 feet in width. On this end there was planted a plot about 200 feet wide with 2-year-old seedling tulip trees. Substantially all grew as well as could be expected for the first year, but at the end of the fourth year from the time of setting them out, practically all were dead except



YELLOW POPLAR IN MANTEL MANUFACTURE

The ability of the wood to take and hold paint well makes it valuable for all white enamel work. These show part of the product of a mantel factory and are made of yellow poplar.

those enjoying the shade of the adjacent forest; but the condition of those in the partial shade varied in the ratio of their nearness to the forest, the plants in the rows next to the woods being far the best, but yet not as thrifty as some naturally planted close by, and about the same age, but among bushes and briars. Of course it is possible that the condition of the "forest floor" had something to do with the result.

It is an old adage that "one swallow does not bring summer," but we can pretty safely conclude that summer is not far off when a lone bird of that species arrives, and it is quite safe to assume that even this single lesson teaches that, however exacting for light the tree may be when past the age we may well call its infancy, it can have too much light and sunshine in its early life. Just how this is to be overcome when the plants are set out in the ground which is to become the forest is an unsolved problem. Such an extent of ground would be too great to attempt to shade with artificial screens. We must endeavor to get nature to do the work; but we cannot afford to grow weeds, briars and the like for that purpose, and, besides, these would serve for only a short time. They would not answer for "nurse trees." There must be a stand of tall, rapidly growing species to do that, for the tulip tree is a rapid grower. Planting a dense stand of that species would not accomplish the end sought, for there would be lacking the shade needed at first. Possibly if some fast-growing species, as European larch, or even red pine, were set out a few years before the tulip trees—at all events long enough before to give the needed shade, these to be planted in alternate rows, or, better, alternately in the rows, so as to shade the little

tulips at first and later on act as "nurse trees"—such a course might be successful. Of course the "nurse trees" would be the ones to be removed in thinning if a pure stand of tulips were desired; or, in case European larch should be planted for such a purpose, some of these could be retained, as European experience indicates that that tree does better in a mixed than in a pure stand, and we know that the tulip will endure others than its own kind for near neighbors. Such a course would, doubtless, secure a good stand of one or both species, and both are valuable.

To be sure, this scheme would be wholly experimental, as will any course, for few attempts have been made in this country to grow the tulip tree for economical purposes, and such as have been undertaken are not far enough along to fully determine what can or cannot be done, and European experience cannot help us much for it cannot be learned that much has been done there along that line. In case it should be ascertained that the trouble lies in a poor "forest floor" instead of lack of shade, it would seem that the plan suggested would still be in the line of practical treatment.

The lack of fertility in the seeds cannot be overcome, but the great abundance of them furnished by nature partially compensates for that, and it will be a strange



Photo by S. B. Elliott.

TULIP OR YELLOW POPLAR FROM SEED

This tree is 16 years old. It was raised from seed and is now 9 inches in diameter, 2 feet above the ground. It bore fertile seeds when 13 years old. It is on the property of the author at Reynoldsville, Pa.

thing if modern ingenuity cannot greatly lessen if not entirely do away with the difficulty encountered in planting in the open which has been alluded to. Because the tree requires partial shade in early life there should be no hasty conclusion that it will grow at that period in a dense, tall thicket, or in the deep shade of a mature forest. If the seeds germinate there the little trees will certainly be suppressed, for they must have more light than such a situation affords. They must have a certain amount of

light in early life, but not too much, and in maturer days all the light they can get. There is a certain course laid out by nature for this species to travel in, and that course does not seem to be easily changed, and we must find that out and follow it to be successful. Nature does it and surely we can learn from her and gratify the peculiar propensities of this valuable tree in some way, and we can afford to expend some labor and money to find out what to do, because of the tree's great economic value.

Collecting Wood Specimens

THE United States National Museum at Washington has recently established a Section of Wood Technology. Under the direction of this section it is proposed to assemble a collection of native and foreign woods of commerce and to illustrate the manner in which they are utilized.

The wood collections are to consist of planks of approximately commercial size and of the best quality. Each wood will be given a natural finish and appropriately labeled and arranged so as to be of the greatest educational value. Specimens possessing rare or unusual qualities, exhibited by such woods as curly birch, bird's-eye maple, figured mahogany and others of beautiful color or otherwise attractive appearance are also to be secured. In addition, there will be a series of specimens illustrating the various styles and qualities of finishes given to different woods.

Supplementing the wood collections it is planned to illustrate their utilization by showing the products of various wood-using industries and also the progressive

steps involved in their manufacture from the raw material to the finished article. In this way will be shown, for example, the making of paper, from the bolt of spruce or other wood through each successive change in its form until paper of various kinds and grades is obtained; similarly the interesting story of veneer manufacture with its beautiful and useful products, the manufacture of excelsior, the making of matches and toothpicks, the distillation of woods and a host of other wood products, the output of many different industries, will be explained by means of comprehensive and instructive exhibits.

Thus far in the work of assembling exhibition material lumber associations, lumbermen and the wood-using industries have shown a gratifying willingness to cooperate with and assist the Museum in developing exhibits of their products. It is hoped that this spirit will continue and sufficient interest will be aroused among them to assure creditable showings for all branches of the business of wood-production and utilization.

American Forestry Association Day

AMERICAN FORESTRY ASSOCIATION DAY at the Panama-Pacific Exposition, Wednesday, October 20, will see the largest combined gathering of foresters, conservationists, forest fire protectors, lumbermen and loggers that the Pacific Coast has ever had. Not only will there be present members of the American Forestry Association, but there will also be members of the Western Forestry and Conservation Association, Pacific Logging Congress, Society of American Foresters, California Forest Protective Association, Biltmore Forest School Alumni and a number of other organizations interested in the subjects to be discussed.

Dr. Henry S. Drinker, president of Lehigh University and president of the American Forestry Association, will preside on October 20 and will make an address on the forest relations between the East and the West. There

will be other addresses by members of the association on a proposed system of forest insurance, on the work of the association and the mission of its magazine, *AMERICAN FORESTRY*, and upon questions of forest fire protection and forest development.

Following the series of meetings there will be a visit to the redwood lumber camps near Eureka, Cal., where two days will be spent in witnessing the operation of cutting, logging and manufacturing the giant redwoods.

Members of the American Forestry Association from the East who anticipate attending may secure any information regarding routes, hotels, etc., from the secretary.

Headquarters for the association on October 18, 19, 20 and 21 will be at the Inside Inn, which is inside the exposition grounds and the meetings will be held at the Lumbermen's Building just across the way from the Inside Inn.

The Bird Department

By ARTHUR A. ALLEN.

[Without birds to wage war upon insects, the insect hordes would increase so enormously that they would destroy all the vegetation in the world—and then what would become of the human race? This department will be devoted to public education on birds and each month will be given advice and instruction for their care and for encouraging bird life.—Editor's Note.]

BIRDS AND THE FORESTS

WHEN the world has once more regained its equilibrium and the great powers have again settled down to constructive policies, one of the questions that will be brought forward is that of international legislation for the protection of migratory birds. It will be a natural outgrowth of the struggle which the United States has witnessed during the past few years between the commercialist and the conservationist, a struggle that has resulted in national legislation giving our birds a more wide-spread encouragement and protection than has ever before been possible.

Had the battle in this country been waged along the lines of sentiment alone, with which these birds are so often and so rightly associated, our practical legislators could never have felt justified in enacting these far-reaching measures. Fortunately, the science of ornithology had already advanced to a stage where it could state definitely the important rôle played by the birds in protecting crops, orchards, and forests. The Biological Survey in Washington and economists in all parts of the country had been studying the food of birds for some thirty years, with the result that the issue was one of real economics rather than one of sentiment.

There are few people today that are uninformed as to the value of birds. The annual loss of over 700 millions of dollars to agriculture in this country due to the ravages of insects and the part taken by the birds in destroying these pests are familiar facts. The birds are nature's guards, appointed to keep the wonderfully prolific insects from overrunning the earth, and, when one stops to consider that a single pair of potato beetles, if uncontrolled, would at the end of a single season result in sixty million offspring; or that a single female plant louse could give rise in the twelve generations which occur each year to over ten sextillion young, one is forced to acknowledge the invaluable asset we have in the birds.

In the garden, however, and in the orchard, it is usually possible by artificial means to battle successfully with insects. Poisonous sprays and cleverly contrived traps with sufficient output of time, labor and expense, will, in most cases, keep the farm in profitable condition. But the whole world is not a garden. It is obviously impossible to exterminate all insects. Human ingenuity will never devise profitable means for spraying the forests or trapping the forest insects. Over 500 species of insects prey upon the oak trees alone and nearly 300 upon the conifers, any one of which, if left uncontrolled, would destroy the trees.

When experiments were being carried on in Massachusetts with the raising of the American silkworms (*Telea polyphemus*), the larvae of which feed upon a number of shade trees, a striking demonstration of the danger from these tree-inhabiting caterpillars was given, for it was discovered that each caterpillar required 120 oak leaves to reach maturity. If all the eggs laid by a single moth should all hatch and reach maturity, few oak trees would be large enough to support a single family. Fortunately, however, it was discovered, at the same time, that in a state of nature 95 per cent of the larvae are destroyed by birds.

Again, in Dakota, when the first attempts were made to grow trees upon the prairie lands, the experiments resulted nearly in failure because of the ravages of this silk worm and closely allied caterpillars, the reason for their destructive numbers being the absence of arboreal birds. This is a problem which always presents itself in the reclamation of waste lands by the planting of trees where tree-frequenting birds are not yet established. It is fortunate that many birds are quick to avail themselves of new territory and that a number of species have extended their ranges during recent years, following the reclamation of arid country.

But even where birds are established it happens occasionally that some insect plague escapes the control of its natural enemies and we have the great destruction wrought by the gipsy and brown-tail moths in Massachusetts, and the defoliation of the shade trees in many of our eastern cities by canker worms, tussock moths, elm-leaf beetles, and tent caterpillars. But during these devastations two facts have been repeatedly noticed. First, the outbreaks have always begun among the shade trees of our cities where birds are conspicuously scarce, and, second, spots to which birds have been attracted have suffered the least.

In this connection the experiments of Baron von Berlepsch on his estate in Germany, in attracting birds and maintaining a number far in excess of the surrounding country, have become almost classic. By putting up thousands of nesting boxes throughout the forest to replace the dead trees which are required by hole-nesting birds, by introducing food-bearing plants, shrubs and trees, by feeding the birds during winter and times of stress, and by destroying their natural enemies, he so increased their numbers that, when an insect plague spread over the country, his estate was the one green spot upon the entire landscape. Such a convincing

demonstration was it that the imperial government followed his example for the protection of the national forests.

But it is not from insects alone that our forest trees suffer. In some parts of the country rabbits and other small rodents have increased so alarmingly at times that during the winter months when other food was scarce they have done thousands of dollars damage by eating the bark and girdling the young trees. The field mouse (*Microtus pennsylvanicus*), which is perhaps the most destructive of the smaller rodents, has from six to eight young in a litter and from four to six litters a year. If left uncontrolled, the offspring of a single pair at the end of five years would number nearly a million individuals. Occasionally this does happen and we have the so-called "plagues of voles" or mice which overrun everything, and when they have consumed all the available food in one region they migrate to another. These plagues do not usually endure long, one of the chief reasons being that they are always followed by flights of owls or hawks which prey upon them.

It is true that one species of owl, the great-horned owl, and three species of hawks, the sharp-shinned, Cooper's and goshawk, do sometimes menace our feathered game and occasionally make a raid upon the poultry yard. These species have been passed upon as more harmful than beneficial, but all the rest of the hawks and owls which are shot indiscriminately are not only important but necessary aids to the Forester, particularly where efforts are being made to reclaim waste lands.

We now have adequate laws for the protection of our insectivorous birds and those for the protection of rodent-eating birds are beginning to follow. Owing to these measures, our avian population in the course of time will show a large increase, but, in the meantime, bird lovers and those who have interests at stake either in gardens, shade trees or forests, will be willing to expend a little effort toward encouraging our birds toward immediate increase. Usually with but small effort the number of birds about one's grounds can be increased manyfold. In succeeding numbers of this magazine articles will appear showing what may be done during the different seasons of the year toward attracting, increasing and taming the wild birds about one's home,

one's garden or one's forest. The first of these on "Bird Fountains" appears in this number.

BIRD FOUNTAINS

NOTHING exerts a stronger attraction upon birds in hot weather than an abundant supply of fresh water. During the dry months of August and September the birds practically desert the dry uplands for the borders of streams or springs, where they can be sure of finding water for drinking and bathing. For this reason the home that has no natural pool or spring nearby must expect to have but few birds during this dry season unless some effort is made to supply the necessity.

Perhaps the most attractive bird pool, or fountain, is that constructed in the form of a rockery in the garden with ferns and wild flowers planted about it. The concrete basin can either be sunk in the ground or raised on a pedestal. If the former, one should make sure that there are no lurking places in the proximity where cats or other enemies can lie in wait to spring upon the birds while they are helpless with soaking feathers.

Other kinds of bird fountains are those made in the form of large pottery saucers raised above the reach of marauding cats, or a still simpler arrangement, which, although less attractive, serves the purpose just as well, is a shallow pan or tray sunk in the ground or placed in any convenient place frequented by the birds.

Whatever type of fountain is selected, a few points should be adhered to. The bottom and sides should be rough so that the birds will not slip upon entering the water, for if they slip once they will never return. Secondly, the water should not be more than a half-inch in depth where the birds are expected to enter. They will often wade in deeper, but the bottom should slope or flat stones should be so arranged that the birds can enter at this depth. And thirdly, the water should be refreshed as often as it evaporates or becomes stale. If feasible, the pool should be connected with the water supply or the drain from the ice-box, a labor-saving device which at the same time makes the pool more attractive to the birds.

These simple arrangements and sure protection from skulking enemies will serve to attract many birds about the garden where they will more than repay for the effort expended by the insects they will destroy, not to mention their cheery calls and interesting ways.





THE MATTERHORN

A view from the roadside, near Riffelalp, above Zermatt; altitude, 7,415 feet.

How Switzerland Cultivates Her Forests

BY MARIE WIDMER

SWITZERLAND, in the year 100 A. D., is described as being covered with swamps and great impenetrable forests and the latter offered tremendous obstacles to colonization. The necessary land for pastures and agriculture had thus to be taken away from the forests and the history of the colonization is consequently closely connected with that of the forests.

Not much attention was paid to the cultivation or preservation of the forests in the early days, when the Alemanni, Burgundians and Franks swept through the land, but in the time of the latter, when Charlemagne was king, a general and remarkable improvement of conditions took place. History relates that Charlemagne's grandson presented in the year 853 the now famous Sihl Forest of Zürich to the Convent of Fraumünster

in that city, which indicates that the Sihl Forest is actually one of the oldest cultivated forests in Switzerland.

Gradually, as settlers began to scatter all over the country, their attention was drawn to the forestry problem and it is shown that in the thirteenth century there were already a number of villages which had prohibited the cutting down of certain forests, as the same provided protection against the ever-threatening peril from the avalanches. Thus we find Altdorf and Andermatt on the Gothard route each with their "Bannwald." For some time the great vaudoise forest of Risoux in the Joux Valley was also considered as a "protecting forest," as its presence could facilitate the defense of the frontier toward France in a case of emergency.



DAVOS, SWITZERLAND, IN SUMMER

Showing the type of municipal and cantonal forests, some of the former of which produce an annual net profit of as much as \$14 an acre, and some of the latter yield as high as \$8 an acre, which steady and ever-increasing revenue helps to reduce taxation in Switzerland to a minimum.

However, only in the eighteenth century was there voiced a general demand for better cultivation and preservation of the forests and in this respect the cantons of Zürich, Berne and Aargau were the leaders, with the others following after a short interval.

The latest statistics of forestation in Switzerland show that 22.7 per cent of the entire area of Switzerland is covered with forests; 52.1 per cent is devoted to agriculture and pastures and 25.2 per cent is non-productive soil (rivers, lakes, roads, railways, building sites, rocks, glaciers, etc.).

Of the productive soil in Switzerland, 30.4 per cent is thus devoted to forests and 69.6 to agricultural purposes. Statistics further show that about 67 per cent of these forests belong to individual villages or cities; 28.5 per cent are private property and 4.5 per cent only pertain to individual cantons. The ownership by canton, village or private persons shows a remarkable variation in the case of each canton and we thus find that the cantonal governments of Valais, Ticino, Grisons and Uri possess practically no forests. The biggest percentage of forests owned by villages—94.3 per cent—is however, found in the Valais, and the highest percentage of private-owned forests—78.8 per cent—is to be found in the canton of Lucerne.

The most extensive forest conservation is found in the Jura region of Switzerland, in the cantons of Schaffhausen, Aargau, Basel (Land), Soleure, Berne, Neuchâ-

tel and Vaud, where as much as 60 per cent of the productive soil is devoted to forestation. While the high



A GIANT

This enormous white willow tree (*salix alba*) is close to the shore of the Lake of Zürich, Switzerland, at an altitude of about 1,440 feet.



A GENERAL VIEW OF AROSA, IN THE GRISONS, SWITZERLAND, ALTITUDE, 6,043 FEET

This is one of the best of the "protecting forests" which are considered a necessary safeguard against natural forces such as avalanches, land slides and inundations, and as a consequence there are certain laws prohibiting their injudicious cutting. Of the entire area of forests in Switzerland, over three-fourths is classified as "protecting forests."

mountain regions appear thickly wooded at first, their production is poor.

Forests, as previously indicated are considered a safeguard against natural forces, such as avalanches, land slides and inundations, and as a consequence there are certain laws prohibiting their injudicious cutting down, and these laws apply to private-owned forests as well as to public-owned ones. All the forests in the canton of the Grisons, Appenzell, Ausser-Rhoden, Uri, Neuchâtel and Basle (City), are regarded as "protecting" forests, while in the cantons of Schwyz, Unterwalden, Glarus and Appenzell Inner Rhoden all public and a part of the private-owned forests are declared "protecting" forests. In the other cantons the public and private-owned forests are partly "protecting forests" and partly non-protecting. Of the entire Swiss forest area 75.2 per cent is considered "protecting forests" and 24.8 per cent non-protecting.

These laws safeguard the Swiss forests from untimely destruction and no matter how much building may be done in a district, the forests have to be duly respected.

The different parts of Switzerland, with their great variation of altitudes, are subject to widely different

climatic conditions and as a result we find a similar difference in the forest growth.

In the Jura, for instance, the beech plays a prominent rôle. It can really be considered the foundation of the Jura forest and, thanks to its thick foliage, it prevents the soil on the sunny slopes from drying up. The protecting presence of the beech enables other more exacting species of trees to grow in their turn, such as the ash, the maple, the fir, and the pitch. On all the slopes with a southern exposure the beech is intermingled with the red pine.

In the plains we find a good variety of the oak, elm, beech, ash, maple, linden, alder, willow, poplar, fir and red pine. Today the pitch tree also occupies an important place in these lower regions.

Approaching the Alps, the pitch tree and fir are more prominent and from 4,500 feet upward the former alone remains. In the central Alps the larch, the cembra pine and the so-called mountain pine are in particular evidence. In certain regions of the Bernese Oberland, in the canton of Unterwalden, around the Lake of Lucerne and in the Rhine Valley the beech is also well represented.



ARAUCARIA IMBRICALA

A famous specimen near Walzenhausen, canton of Appenzell. Altitude, 2,273 feet.

Finally, in the southern part of the canton of Ticino, in Italian Switzerland, the chestnut grows in profusion.

While in early days the forester's principal task was to dispose of the timber, to be a fairly good shot and to keep general order on his domain, the public has, since the middle of the last century, begun to wake up and with the realization of the immense value of the forests came a general demand for a more thorough and scientific instruction of the foresters.

A forestry school exists in Switzerland since 1855, making part of the Federal Polytechnic at Zürich. From 1855-72 the duration of the course was two years, from 1872-82 it was two and one-half years, from 1882-1909

it was raised to three years, and since October, 1909, it has been prolonged to three and one-half years. This theoretical course has yet to be completed by an obligatory practical course of one and one-half years. The duration of the entire course in the science of forestry consequently amounts to five years.

The timber production of the Swiss forests has reached the comparatively high figure of 40,000,000 francs a year. The average annual export amounts to about 3,000,000 francs, but there is still an annual importation of wood for about 30,000,000 francs. This somewhat surprisingly high import is explained by a continually increased demand for wood by the paper industry, also by a much developed building activity.

The statistics available concerning the average increase of the Swiss forest cultivation do not yet suffice by far for an approximate valuation of the respective financial returns. However, in all those cases, where it has been possible to investigate the question, the proposition has proved itself a paying one.

Thus it is shown, for instance, that the municipal forests of Aargau produce an average gross profit of \$14 per acre, those of Zürich, Winterthur and Morat, \$12 per acre, and the most recent statistics in the case of Winterthur indicate a revenue of \$14.90 per acre. Admitting that these are somewhat exceptional instances, we nevertheless find that the general results of the cantonal forests of Aargau and Zürich reach a gross profit of \$8 per acre, while the richest state forests in Germany scarcely ever surpass a revenue of \$5.60 per acre. The returns in the Jura and the Alps, where the soil is naturally inferior, amount to \$3.25 to \$4.80 per acre.

This steady and ever-increasing revenue yielded by the forests helps to reduce taxation in Switzerland to a minimum.

The climatic and hygienic value of forests must also be taken into consideration. No place becomes oppressive from the summer's heat, or unpleasant through the winter's cold, if it is situated in a forest region. It is an established fact that all the renowned Swiss health resorts are in closest vicinity to woods and forests whose purifying presence and wholesome fragrance act like a tonic on the human system.

Reforestation and forest planting require much patience at first, as it takes so long for a crop to mature, but the results obtained in Switzerland will undoubtedly induce other countries in time to adopt a similar system, which makes the best possible use of land not suitable for agriculture and which at the same time has all the climatic and hygienic advantages pointed out above, not to mention the natural charm, the scenic value and the soothing effect of a stretch of dark-green, silent forest.



Mr. Charles Frederick Quincy

Director of the American Forestry Association and Chairman of the Executive Committee.

ORIGINALLY from Massachusetts, Mr. Quincy has for years had his business location in New York City, while maintaining a summer residence on Squam Lake, New Hampshire.

As a personal friend of ex-Governor Guild, deceased, he was invited by Governor Guild when the latter was president of the American Forestry Association, to become a member of the Board of Directors, with the particular desire on the part of President Guild that Mr. Quincy, with his large experience in finance, should look into the financial side of the Association, its affairs at that time being in a rather precarious condition.

Mainly under his leadership as chairman of the executive committee of the board, the Association has been lifted from an unsatisfactory financial position to its present basis of increasing prosperity. Our very successful bond plan for the development of our work and the bettering of our magazine was his idea.

Today we hold in securities twice the amount of our bonded indebtedness. The Association has attained a position of national recognition and its work in public service is recognized as great and increasing.

To Mr. Quincy—to his tact, his faithful devotion to his self-imposed duties in the Association, and to his experience and ability in financial management—the Association owes a great debt for services deeply appreciated and valued by his associates in the work.

HENRY STURGIS DRINKER.

Fire Fighting Exhibit at the Exposition

DON CARLOS ELLIS is in charge of the Forest Service exhibits at the Panama-Pacific Exposition which are attracting so much attention from the thousands of visitors, who are curious to learn what the Government is doing with the great forest areas under its control. The larger exhibit is at San Francisco and the feature about which most of the inquiries are made is the forest fire protection and fire fighting exhibit. This is complete in every detail.

In the center of the space is a large model, measuring 12 by 15 feet, showing a ranger district on a national forest. A lookout house and a lookout tower occupy the two highest peaks. These are connected by telephone with a ranger station, which in turn is connected with various users of the forest at a ranchhouse, a hotel, and a powerhouse. The model shows Government roads, trails and bridges, constructed primarily for the purpose of making every part of the forest accessible to fire fighters. Fire-fighting equipment boxes are placed at strategic points along trails and roads, and a fire line kept clear of inflammable material runs along one of the mountain ridges.

To one side of the large center model a full-size fire lookout house, fully equipped for discovering and locating forest fires, is built on an imitation of a great boulder on a mountain top. The house is painted white to serve as a conspicuous target for heliograph messages directed toward it by patrolmen. The building contains binoculars through which a distant forest fire is seen; a fire finder, by the aid of which the supervisor's office can be informed definitely of the location of a fire; and a special type of telephone in communication with the supervisor's office. There are also on display in this tower a portable telephone and a portable heliograph outfit for use by patrolmen. A pair of stereopticon machines are concealed within the imitation rock on which

the house rests and throw pictures and descriptions on screens built into the rock, which tell the entire story of the fire protection work.

On a redwood tree trunk in another part of the exhibit is displayed a weather-proof iron box telephone, such as is placed along patrol routes on the forests. This telephone is connected with the telephone in the lookout and with a supervisor's telephone at the desk of the demonstrator by slack lines attached to tree trunks on swinging insulators, just as the line is installed on a national forest. This manner of construction enables the line to stand the stress of the elements through the winter and prevents the wire being broken when a tree falls.

The latest type of fire-fighting toolbox, equipped with shovels, rakes, hoes, axes, canvas waterbags and buckets, canteens, lanterns for fighting fires at night, torches for setting back fires, nesting cooking utensils, and emergency rations, occupies a place near the lookout house.

Beside the desk of the demonstrator, who plays the part of the national forest supervisor, is hung a master fire map of the forest similar to the one in the lookout house. On this map is shown the location of every trail, bridge, road, telephone line, telephone station, ranger station, fire-fighting toolbox and lookout station. At the locations of the lookout points are protractions oriented to correspond with the protractions of

those stations. This map enables the supervisor to locate a fire directly from the reports of the lookouts without any mathematical calculations, and to place to the best possible advantage the force of men available.

Fire warning posters and rules concerning care with fire in the forests are posted upon tree trunks and in other conspicuous places through the exhibit as they are in the forests.



DON CARLOS ELLIS

In charge of the Forest Service Forestry Exhibits at the San Diego Exposition and at the Panama-Pacific Exposition, standing at the Entrance to the Building Containing the Exhibit at San Diego.

California Tree Novelties

By E. A. STERLING

PART II

THE California redwoods and Sequoias have been described until they are familiar to every visitor.

The Sequoias, in particular, are the mecca of many tourists and may be seen at their best on a trip to Yosemite by way of the Raymond and Wawona entrance. The other groups of Sequoias are not so frequently vis-

itunately, is within a few hours' ride of San Francisco, and should by all means be visited. It is reached from Santa Cruz by the Southern Pacific, and a day in the park will give some idea of the redwood forests in the lumber regions of Humboldt and Mendocino counties. These magnificent trees, however, are fully worth a trip



A GROUP OF SEQUOIAS

This is the largest cone-bearing evergreen tree in the world, and the oldest. Some reach a height of over 300 feet, but the average is about 270 feet. The trunks are from 17 to 24 feet in diameter at about 8 feet above the greatly swelled bases. This California big tree is in a region of about 50 square miles, within which there are twenty-six groves. One of the largest of these, called the Grant Forest, contains 5,000 trees. Some groves contain few, Deer Creek Grove having but thirty, and North Grove only six. The larger trees are between 4,000 and 5,000 years old.

ited, although thousands are attracted annually to the Mariposa grove and General Grant National Park. In the Yosemite Park, to which more and more tourists now go and which will be seen this year by more than ever before, there is a considerable variety of trees to be seen. Here the tourist, making his headquarters at one of such tent camps as shown in the accompanying photographs, may, in a few days, see all of the points of interest within the park.

The California redwood forests at their best are off the regular routes of travel. California Redwood Park, for-

up the Northwestern Pacific R. R., and over the new line from Willits to Eureka or by steamer to Fort Bragg or Eureka. Eureka will be visited by the members of the American Forestry Association after their meeting in San Francisco on October 20, in order to see the redwood forests and the lumber camps. Here the trees grow in solid forests of a density and splendor to which no description can do justice. By comparison, the best specimens of individual trees found on the slopes of Tamalpais in Marin County or in California Redwood Park are reproduced by thousands or millions, and by

their intimate association create a continuous forest in which the units or individual trees are almost lost sight of in the surpassing grandeur of the whole. It is a case of nature surpassing herself in the production of extremes in sizes, quality and quantity. The great colonnades of redwood trees have been likened to some wonderful cathedral, but, unlike any works of man, they extend over hundreds of square miles and produce a variety of conditions and vistas absolutely unattainable in the highest art of the architect.



WIND-BLOWN REDWOODS

This is in the Monterey National Forest in California. Here the winds from the ocean are so strong and persistent that they have the unusual effect upon the growth of the tree so vividly shown in the photograph.

The influence of environment is demonstrated by comparing the redwoods at the northern and southern limits of their range. While the character of the redwood forests changes materially on different sites in the several belts and groups from Humboldt County southward, a radical change is found on the seaward side of the Santa Lucia Mountains below Monterey. Here at its southern limit the redwood loses its dominant character, and in exposed situations becomes a gnarled, stunted and wind-flattened tree. In the protected canyons it grows to more nearly normal size, but decreases in height up the slopes until near the ridge summits it takes on the shape of a limber pine at timber line on some high mountain. The effect produced when viewed from a high point is peculiar, the canyon forests being practically flat to the

level of the protecting ridge with the trees in the center tall and straight, but decreasing in size up both slopes as if they all had been clipped off to one height like a hedge.

The famous old city of Monterey is the starting point for several trips which take in rare or unusual trees. One of these is to the stunted, wind-flattened redwoods just mentioned, which involves a trip by carriage or horseback to the settlements some distance down the coast. Such an excursion also shows much that is best in the way of sea-coast scenery. The shorter drives usually taken by the tourist from Monterey traverse the range of two trees which exist only on this particular part of the California coast. In fact, the main attraction of one of the drives, vying in interest with the old Missions, is the famous Monterey cypress. On the peninsula between Monterey Bay and Carmel Bay are the individual trees which have been so widely pictured and are so well known to tourists. They are picturesque specimens on



STUMP OF SEQUOIA

This stump is 20 feet in diameter. It was cut unusually high, not because it was convenient to do so but because the old fire scars made it worthless as lumber up to the point where the cutting was made. This stands in the Sequoia National Forest, Tulare County, Cal.

an exposed rocky sea cliff, where the artistic setting, wide, flat-topped crown, and grotesquely bent and gnarled trunk and branches, create an unusual spectacle. The natural belt of Monterey cypress is only a few hundred feet wide along the coast, with a few trees scattered inland on the ridge of the peninsula. Although extensively planted as wind breaks, there is no other natural group of these trees anywhere in existence.

Despite this fact there is a widespread belief that these trees are descendants of the famous "cedars of Lebanon," and despite the efforts to remove it the im-

pression still largely prevails in the public mind. Mr. H. A. Greene, president of the Monterey Tree Growing Club, has an interesting explanation of how the belief originated. Says he: "Some years ago, a man named Aleck Early was driving for the Hotel Del Monte and making himself remembered for his wit by people from all parts of the world. Many of his stories told to wondering tourists were prefaced by 'When me and Charley—.' This was a reference to Charles Crocker, one of the 'Big Four' who developed the Pacific Railroad system. Aleck had been an old stage-driver and, for a time, was in the employ of Crocker and, having become too old to continue in such employment, he was sent to Hotel Del Monte by Crocker, who was the real sponsor for the famous hostelry, to be given a berth. As driver for the hotel's livery stable, Aleck spent his happiest days entertaining tourists with his wonderfully told tales, and he became so popular with visitors that often when people wired to reserve rooms they would also reserve the great story teller as their driver about the Monterey peninsula.

"Aleck Early's favorite story was evoked when his guests were driven into the weird presence of the ancient cypresses at Point Cypress on the world-famous Seventeen-Mile Drive. This was the tale of a highly civilized race of people who came to this vicinity thousands of years ago and builded a magnificent city with matchless temples of worship. Pointing to a large sand-dune he would explain that a partial exploration had revealed immense columns and capitals, strangely but beautifully carved, prostrate under the sands. This story, told in very ungrammatical sentences yet with originality of wording and a convincing manner, ended with a recital of the extinction of the colonists by hordes of cannibals. At its conclusion, Aleck would wave his whip toward the ancient cypress trees still growing in the vicinity of the 'buried city' and declare that they had been planted, about 6,000 years ago, from seed of the Cedar of Lebanon, brought across the sea from Syria.

"It was a ridiculous story, but the part about the trees

it seems impossible to destroy. Writers persist in referring to this wonderful grove of prehistoric trees—so much more wonderful than trees of history—as being of the same species as the sacred cedars. The Monterey



MARGIN OF REDWOOD FOREST

This is in Big Basin, Santa Cruz County, Cal. The tree behind the buggy is 7 feet in diameter and 260 feet in height.

cypress is no more a true cedar than it is an oak. It is probably the parent of all the cypresses and is extinct save on the extremities of Point Cypress and Point Lobos, near Monterey. The tree was discovered by La Perouse in 1786, but did not receive its name until 1846 when Hardweg rediscovered it and named it *Cupressus Macrocarpa*, meaning 'large fruited cypress.'

Another tree confined to the immediate vicinity of Monterey is the Monterey pine, which is unique because of its isolated sea-coast habitude. Where growing in thick groups somewhat protected, it has tall, clean trunks, with an open, rather long and large branched crown. The older trees are flattened at the top, and where ex-



TYPE OF CANVAS BUNGALOW IN YOSEMITE VALLEY CAMP

Secretary of the Interior Lane's policy of opening our national parks as real playgrounds for the people strikes a new and popular note in these splendid camps, where the tourist with a medium-sized purse can get close to nature at a minimum expense. Seated in hammock is George Sterling, the California poet; standing is Lawrence Harris, whose poem on the San Francisco fire received world-wide comment, and on the chair, E. D. Coblentz, editor of the *San Francisco Call*.

posed to the salt winds, take on irregular shapes, resembling the Monterey cypress. It has, however, a considerably wider range, there being three groups along the coast and others on the Santa Rosa and Santa Cruz Islands.

Three other trees of limited range or rare occurrence deserve specific mention. One of these, the bristlecone fir, is found mainly in Monterey County, where it is irregularly grouped or scattered on the eastward slopes of the Santa Lucia Mountains. It is a little known tree because confined to a region which attracts few visitors. The only place it would be seen without a special trip is along the stage road near Pajarijo Springs. It is the most unique of all the firs, and striking in character because of its dense Indian club-shaped crown, which often extends to the ground, and ends in a long, extremely narrow, sharp point. The foliage is of a lustrous green, so pronounced that the color becomes a distinguishing characteristic at some distance. A further remarkable feature is found in the cones, which have long needlelike points, which protrude from among the cone scales. While not deserving a special trip in order to see it, the bristlecone fir merits attention from anyone who is in the region where it grows.

The rarest and most restricted of all the California conifers is the Torrey, or Soledad pine of San Diego County. It is confined to a sea-coast range about 1 mile wide on both sides of the mouth of the Soledad River,

and to a limited area on Santa Rosa Island. Where exposed to the high winds, it is low, crooked and deformed, although in protected situations it may have a straight trunk 50 or 60 feet in height. A few of these trees can be seen from the Santa Fe train between Los Angeles and San Diego, the narrow strip along the coast starting about 3 miles north of Del Mar.

Another interesting evergreen of considerably wider range is the coulter or bigcone pine. The general distribution of this tree is the middle elevations on the coast and cross range mountains in Southern California. Although common throughout this range, it is nowhere abundant, and rarely forms pure forests. Its claim to particular notice is the enormous size of the cones, which are often 12 to 14 inches long, sharp spiked and armed, and extremely heavy. None of the other pine trees protects its seeds in such a strenuous way, and while the sugar pine cones are longer, the cone scales are thin, light and harmless by comparison. Visitors to any of the well-known mountain resorts or peaks in Southern California can hardly miss seeing some of these trees. The large cones and stiff foliage will distinguish the coulter from yellow pine, while the cone itself deserves close investigation and proves an interesting and lasting souvenir.

Of the California trees which are unique or different, the pines receive special attention. This is deserved because no less than seventeen distinct species grow in California and at least six are found in no other State,



MONTEREY CYPRESS ON THE SEA COAST

While these trees are true native sons of California, growing only around the Bay of Monterey, they have become generally known to the public as "cedars of Lebanon." In this article is explained the interesting origin of this misnomer. These old trees are the mecca for most sight-seers along the California coast.

although three of the six extend down into lower California. Their range is from the limber pine at timber line down to the pinon pine of the desert regions. In character of growth and appearance the range is as equally great. From the southern Sierras southward on arid slopes and mesas into northern Mexico is the dwarf single leaf or pinon pine. Of all the American species, no other pine has single leaves. The tree is further distinguished by the large size of the seeds which are known as pinon nuts, and have long been used by the Indians for food. The transcontinental traveler on the Santa Fe trains can buy these pine nuts from the Indians or at the stations, as peanuts are bought in the East. Another nut pine, which is less common, has four needles or leaves, which is also an unusual arrangement. The true white pines have five needles in a cluster and yellow pines two and three, so there are, out of the seventeen species, all arrangements of needles from one to five.

Another characteristic of the California pine is found in the various kinds of cones. They range in size from the enormous fruit of the coulter pine to the diminutive seed pod of the pinon or lodgepole, and from a smooth symmetrical shape and surface to a bristly, heavy cone which protects and hides its seeds until nature sees fit to open the scales. The bristlecone, lodgepole and knobcone pines, have very persistent cones, the latter often holding successive crops of cones indefinitely. They ad-

here to the trunk and branches and are often found imbedded in the wood, and rarely do the cones open until the tree is killed by fire or cut; yet some of the seeds remain fertile during all these years. The knobcone pine is the most conspicuous conifer on the intermediate slopes of the mountains back of Los Angeles, San Bernardino and Santa Barbara, and the persistent clusters of old cones can be readily seen.

Hardwood trees are not abundant on the Pacific coast. There are comparatively few broad-leaved trees of commercial value, and as a rule these are an inconspicuous feature of the landscape except along streams at the lower elevations. A sycamore very similar in appearance to the Eastern species is common along streams throughout the State, while in all of the foothills are a number of oaks, some of which retain their leaves the year round. These low-growing, round-topped oaks are an attractive feature along many roads and trails below the range of the conifers. For example the Ojai valley near Santa Barbara is made attractive by its oak trees, while along many streams, even back in the mountains, a fringe or belt of broad-leaved species breaks the monotony of the view. On the higher slopes and along the coast in the redwood country, tan bark oak is in many places quite abundant. Here are also found chinquapins which are similar to the Eastern chestnut, and under favorable conditions become large trees, although in the higher mountains forming low shrub. Maples, buckeye, ash and other



Photo by The Pillsbury Picture Co.

YOSEMITE FALLS CAMP, YOSEMITE VALLEY

From this tent city, for there are several hundred comfortable canvas bungalows back of the dining room and office buildings shown in the picture, the tourist visits any part of the beautiful park he desires and sees an interesting variety of tree life. The Yosemite Falls, seen apparently so close to the camp, leap 2,400 feet from crest to valley in three splendid cascades.

trees familiar in the East are found, although rarely of commercial size or in any considerable quantity. A peculiar tree in a class by itself is the rare California nutmeg, a member of the yew family. Found in central California, it forms dense thickets and associates with the hardwoods along streams. The name is derived from the resemblance of the fruit to the nutmeg of America.

Although not in the class of trees, the various shrubs which go to make up the chaparral of the slopes and foot hills deserve mention. In the mountains of Southern California over seventy distinct species constitute the almost impenetrable mass of shrub growth which covers many of the slopes. In the San Bernardino and San Jacinto Mountains, the chaparral area is 50 per cent, while in the San Gabriel Mountains it increases to 80 per cent. Small chance, therefore, that anyone will miss this feature. Chaparral also comes in after fire

and cutting in the northern mountain forests. Consideration of the different species is not of particular interest, and it is sufficient to know that several kinds of dwarfed oak are found in the chaparral growth. A group of low and slender trees or shrubs known as *Ceanothus* or myrtles grow in the low mountain canyons of Southern California and add an effective touch to the landscape by their fragrant blue flowers, which appear in long, wide bunches, from which the common name, lilac, is derived.

Two groups of small trees or shrubs attract immediate attention because of their red-brown trunks, red branches and shiny, evergreen foliage. One of these is the well-known Manzanita, which is an evergreen shrub widely distributed throughout the Pacific coast. It is found at the foot of cliffs, on the edge of the forests, and scattered throughout the chaparral from one end of the State to the other, usually in a variety of soils from sea level to several thousand feet elevation. Occasionally, under favorable conditions, it becomes treelike, and, wherever found, adds a touch of color to the landscape. The other red bark tree is the Madrona, which often reaches a height of 60 to 80 feet, about 2 or 3 feet in diameter, but can become low and shrubby more like the Manzanitas. It produces showy, large clusters of flowers resembling lilies-of-the-valley, and may be looked for along any of the established routes of travel.

To attempt a summary of the trees and shrubs to be seen from the trails and roads which the California Exposition visitor will traverse this summer, would be a hopeless task. The most that can be hoped for is to call attention to the unique and beautiful in the way of tree growth which may be seen if it is only looked for. It should not be enough for a party to go from Los Angeles to the top of Mt. Lowe or Mt. Wilson in the conventional way. To return without

realizing that they have passed through several distinct zones of tree growth, and have had an opportunity to see the effect of natural conditions, such as elevation, aspect, temperature and moisture on the distribution of the flora and also the effect which fire and other human agencies have had on the forest cover of the Southern California mountains, would be a distinct loss of an opportunity. Along the stream beds at the foot of the slopes will be seen sycamores, oaks and other hardwoods, followed by the chaparral of the arid foothills. Farther up in the moist canyons will be seen the bigcone spruce and perhaps other evergreens, and on the more exposed slopes the knobcone pine and perhaps the coulter pine with its big cones. The north and east slopes will be the most densely wooded, while on the hot, dry, south slopes, shrubs and trees with desert characteristics will prevail. Finally, on the summit of the main ridge and in the moist canyons of the main Sierra Madre, will be found the

yellow pines, firs, and cedars grouped according to their environment.

The same observations with the proper adjustment for locality and conditions may be made along any other

of view the Sequoias or redwoods and even Yosemite itself will not be the only things to register an impression, for if you can bring back with you visions and descriptions of trees and forests which the average visitor does not see, you will have something which will be an asset and treasure through the years.

John Muir, who knew every foot of it, eloquently described the chief forested region of California when he wrote:

"In the middle region of deepest canons are the grandest forest trees, the Sequoia, king of conifers, the noble sugar and yellow pines, Douglas spruce, libocedrus, and the silver firs, each a giant of its kind, assembled together in one and the same forest, surpassing all other coniferous forests in the world, both in the number of its species and in the size and beauty of its trees. The winds flow in melody through their colossal spires, and they are vocal everywhere with the songs of birds and run-



DESOLATION VALLEY, PYRAMID PEAK IN THE DISTANCE

The two trees in the foreground are silver pine. The scene is in the El Dorado National Forest, Cal.

routes of travel. Before you go and after you get there read some of the best literature regarding the flora of California. John Muir, through his books, inspires you with a love and appreciation of the scenic wonders of his native State. Carry his "Mountains of California" with you and try to see them through his eyes. On many trips you will be within the National Forests and the officer of the Forest Service can broaden your view and direct your observations wherever you go.

The main thing is to know what you want to see and where to see it. Trees and forests are probably not the fundamental attractions you will see, but they should be the setting on many of your travels and supplement the other natural features for which you will make special trips. Distances are great compared with the East and stage and horseback trips are not always an unalloyed joy. The best way to forget the dust and heat and discomfort is to have something which will distract attention from the crowded stage and the blazing sun. This you will have in the constantly changing flora on most of the trips which are worth while. With the right point



LUMBERED SLOPE IN SAN BERNARDINO MOUNTAINS

Away in the distance, through the gap beyond the trees, the Mohave Desert may be seen. The trees that are visible are pine, fir and incense cedar.

ning water. Miles of fragrant ceanothus and manzanita bushes bloom beneath them, and lily gardens and meadows, and damp, ferny glens in endless variety of fragrance and color, compelling the admiration of every observer.

"Sweeping on over ridge and valley, these noble trees extend a continuous belt from end to end of the range, only slightly interrupted by sheer-walled canons at in-

tervals of about fifteen and twenty miles. Here the great burly brown bears delight to roam, harmonizing with the brown boles of the trees beneath which they feed.

"Deer, also, dwell here and find food and shelter in the ceanothus tangles, with a multitude of smaller people. Above this region of giants, the trees grow smaller until the utmost limit of the timber line is reached on the stormy mountain slopes at a height of from ten to twelve thousand feet above the sea, where the dwarf pine is so lowly and hard beset by storms and heavy snow, it is pressed into flat tangles, over the tops of which we may easily walk. Below the main forest belt the trees likewise diminish in size, frost and burning drouth repressing and blasting alike."

In no other State is there such a wealth of novelty in trees, in no other State such a variety, and in no other State trees which are so widely known and about which so much has been written as those of California. The tourist will find



A FOREST NORTHWEST OF PINECUSHION, SIERRA NATIONAL FOREST, CALIFORNIA

A dense Sierra forest at the higher elevations, where the trees of red fir and silver pine are practically all of the same age. Such forests are usually found at elevations of six to eight thousand feet and are of greater value in preserving moisture than for lumber purposes.

his trip to the State incomplete if he fails to pay them the attention they deserve.

Education in Wood Uses

WHAT is considered the most important movement ever undertaken by the lumbermen for the development and progress of their own industry is the organization, just perfected, of a department of trade extension. It will have a minimum fund of \$50,000 a year for operating expenses. While this is a comparatively small sum for the work involved it will doubtless be increased as the importance of the work is emphasized. The department is under the direction of an executive committee consisting of the following members of the National Lumber Manufacturers' Association: Edward Hines, W. A. Gilchrist, R. B. Goodman, E. B. Hagen, Wm. H. Sullivan and R. H. Downman.

Briefly stated the Department will undertake to promote the use of wood and to conduct an educational

propaganda which will at least maintain the present status of wood under the pressure of modern competition and selling methods. The field of activity concerns wood as such and does not duplicate nor conflict with the work of existing organizations. Education in the broadest sense is the keynote and every dollar used is an investment on behalf of the whole lumber industry. The initial lines of work will cover the following subjects: Building codes and shingle ordinances; engineering data for architects and engineers; fire protection; wood preservation; retail lumber sales extension; agricultural helps in lumber uses; cooperation with other organizations; publicity; and methods of promoting competitive materials.

Ornamental and Shade Trees

A Department for the Advice and Instruction of Members of the American Forestry Association.

EDITED BY J. J. LEVISON, B. A., M. F.

Arboriculturist Brooklyn Park Department, Author of "Studies of Trees," and Lecturer on Ornamental and Shade Trees, Yale University Forest School.

FALL PLANTING

NO MATTER whether we plant in the spring or in the fall, now is the time to commence the necessary preparations. This is the time to decide how many trees we need, of what species, where to place them and where to purchase them.

August or September is the best time to visit the nurseries for a personal selection of the plants required for both fall and spring planting. Even if the plants are to be used in the spring, one can have a wider choice of material if the selection is made at this period and selecting thus early will also prevent delay in delivery at the planting period, especially in the spring, when the pressure of time is very great.

Nursery-grown trees are preferable for planting to those grown in the forest. The nurseryman in training his trees aims to develop a compact fibrous root, a straight stem, a symmetrical crown and a well-defined leader. Trees grown in a neighboring nursery are better adapted to local soil and climatic conditions than those grown great distances away, and transporting them will entail less danger from injury in drying out of the roots and breaking of branches.

The quality of the trees with relation to local conditions is also important. It is important to consider such questions as to whether the plant requires a great deal of moisture or whether it will thrive in poor, sandy soil; whether it will tolerate considerable shade or whether it requires full light.

For lawn planting the low branching of the tree is a factor, while for street planting the branches should start at about 7 feet from the ground.

For street planting, it is also important that the stem should be perfectly straight and about two inches in diameter.



A HONEY LOCUST

A fine tree for an open lawn and for park purposes.

WHEN AND WHERE TO PLANT

Early spring, just before growth begins and after the frost is out of the ground, is the best time to plant most trees. From the latter part of March to the early part of May is generally the planting period in the Eastern States. Some consider the fall just as suitable a time to plant as the spring, and with some species and in some localities this is undoubtedly very true.

The location of the trees with relation to each other should be carefully considered. On the lawn they should be spread apart far enough for the full development of the crown. On streets trees should be planted 30 to 35 feet apart and in case of wide-spreading species like the elm, 40 to 50 feet is not too much.

HOW TO PLANT

An abundance of good soil (about 2 cubic yards)

is essential with each tree where the specimen used is an inch or two in diameter. A rich mellow loam, such as one finds on the surface of a well-tilled farm, is the ideal soil. Protection of the roots from drying is the chief precaution to be observed during the planting process. Evergreens are more tender to exposure than

deciduous kinds and are consequently lifted from the nursery with a ball of soil around the roots. All bruised roots should be cut off and the crown of the tree of the deciduous varieties should be slightly trimmed back in order to equalize the loss of roots by a corresponding decrease in leaf surface.

The tree should be set into the tree hole at the same depth that it stood in the nursery. Its roots, except those with a ball of soil around them, should be carefully spread out and good soil worked in among them. Every fine rootlet is thus brought into close contact with the soil. The first few layers of soil should then be added firmly and the last layer allowed to remain loose in order that it may act as a mulch for the water, which is to be poured on freely immediately after the tree is planted.

WHAT TO PLANT

The choice of material will vary with the general region of the country and the local moisture, soil and atmospheric conditions, as well as with the particular aesthetic effect in the mind of the planter. No brief list of plants, given here, can, therefore, presume to be either complete or meet all the requirements of every reader. The only purpose a list like that can serve is by way of suggestion—to show, at least for the Eastern States, a few of the species that are generally considered worth planting

ORNAMENTAL TREES

1. American elm.
2. Pin oak.
3. European linden.
4. Red maple.
5. Copper beech.
6. Coffee tree.
7. European white birch.
8. Gingko.
9. Horsechestnut.
10. Sugar maple.
11. Soulange's magnolia.
12. Flowering dogwood.
13. Japanese cutleaf maple.
14. Oriental spruce.
15. Austrian pine.
16. Bhotan pine.
17. Japanese umbrella pine.
18. Obtuse leaf Japanese cypress.
19. Blue spruce.
20. White pine.

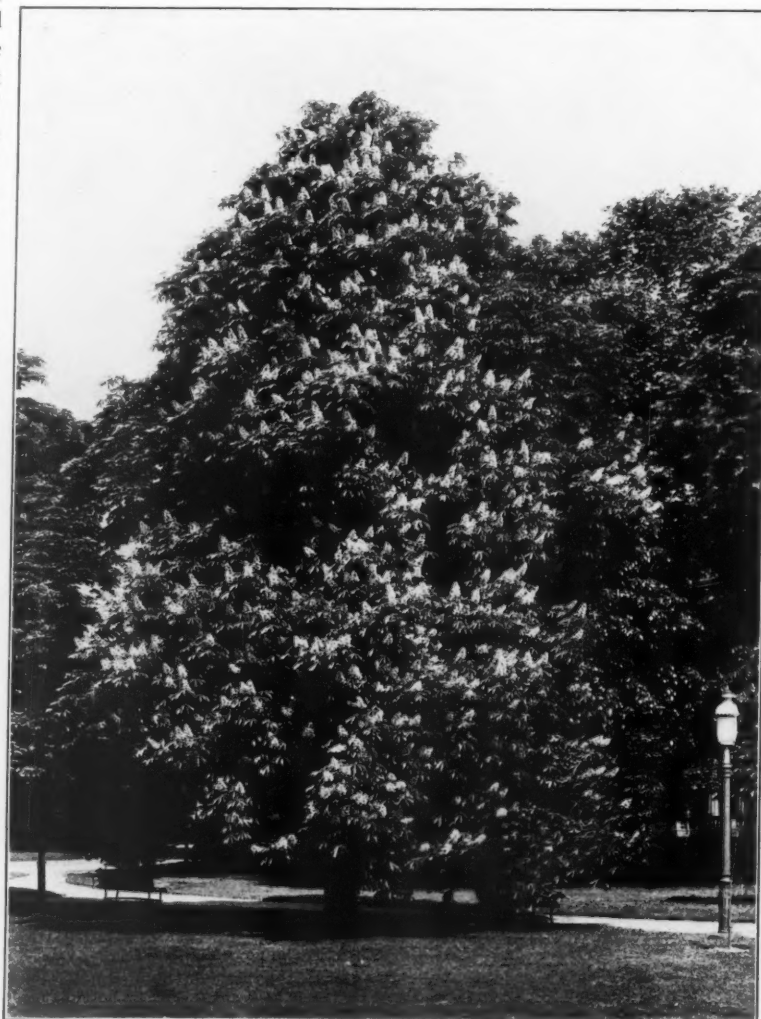
STREET TREES

1. Oriental sycamore.
2. Norway maple.
3. Red oak.
4. Gingko.
5. European linden.
6. American elm.
7. Pin oak.
8. Red maple.

QUESTIONS AND ANSWERS

AMERICAN FORESTRY invites its readers to send any questions they desire to this department and they will be answered without delay.

Discussion of the following questions is requested by the readers of AMERICAN FORESTRY, and expressions of opinion, addressed to the Editor of this Department, will be appreciated.



HORSE CHESTNUT TREE

This is a great favorite for garden and street tree planting, its large leaves and great spread making it particularly desirable as a shade tree.

1. How shall we determine what sections of a city should be included in the "Treeless Zone?" To what extent should business houses and commercial traffic across footways influence this?

Q. What can be said for and against the following practically untried trees for street and highway purposes?

- (a) Kentucky coffee tree (*Glymnocladus dioicus*).
- (b) Willow oak (*Quercus phellos*).
- (c) Hackberry (*Celtis occidentalis*).
- (d) Yellow wood (*Cladrastus lutea*).
- (e) White ash (*Fraxinus Americana*). Considera-

tion of these species is invited, with special reference to use in latitudes between New York and Richmond.

In reply to above questions on street trees, this discussion is based on my experience in the care of trees in the city of Wilmington, Del.

1. I consider the determination of the limits of the "Treeless Zone" to be purely a local one. Decision in all cases can only be reached after a close study of the existing conditions. The narrow streets of this city greatly hasten the crowding out of trees in the business center and manufacturing sections, but we are retaining every tree which it is not absolutely necessary to sacrifice. Our treeless zone is comparatively small.

2a. We have, too, a Kentucky coffee tree which was planted over sixty years ago, now in a dying condition. This tree lived through grade changes, neglect and abuse, and stands in brick pavement. Size, 18-inch diameter, and about 80 feet high. I find the Kentucky coffee tree has a tendency to have weak crotches.

2b. Have some fine willow oaks along the park drives. They are about 20 years old and in good condition. Their straight, clean stems make them fine avenue trees.

2c. Our single specimen of hackberry as a street tree is fine. Size, about 12 inches, stem 30 feet high. This tree leads me to believe they would make a good street tree.

2d. We have some large yellow wood trees on the edge of lawns close to the street; they are in good condition. These specimens have divided heads and branch low, features not desirable in street trees. This would probably be corrected in young trees by proper pruning.

2e. White ash are scattered quite generally throughout the city, varying in size and age. All seem to make good trees, give us very little insect trouble. Some very old specimens do well by cutting back to renew the top.

M. S. BLOWER,

Y. M. C. A., Wilmington, Del.

In discussing the above questions I wish to make the following answers:

1. There is no reason why there should be a "treeless zone." The business streets in Washington, in Paris, London and Berlin all have trees. If properly chosen and trimmed, trees are no interference on a business street, but rather an aid to the shopper. In factory districts

where atmospheric conditions are unfavorable, we can resort to the poplar and ailanthus. The only streets where trees might be eliminated would be those where there are markets and warehouses, where trees would really interfere with the convenience of the public.

2a. *Kentucky Coffee*—a very hardy tree free from insects and disease. Should be tried for street planting. The fact that it sends out its leaves late in the spring is a point against it.



SPRAYING ON A LARGE BROOKLINE, MASS., ESTATE

This is the most powerful sprayer in the United States, so the owners claim, and it also has the largest tank capacity.

2b. The *willow oak* is similar to the pin oak in its habits and see no reason against its being tried out for street planting.

2c. *Hackberry* makes a good shade tree in the middle west. Not so desirable for the East.

2d. *Yellow wood* is not sufficiently hardy for a street tree and does not have the necessary form.

2e. *White ash* ought to make a good tree for highways. Can see many fine specimens along highways in Massachusetts. In the city it would be liable to attack by oyster shell scale, but that should not be a point against it.

J. J. L., *Brooklyn, N. Y.*

Q. The contention has often been made that locust trees have a beneficial effect upon crops growing near them or that crops grown on fields on which there was previously a stand of black locust thrived better than those on adjacent fields. Will you please advise me?

S. T. D., *Washington, D. C.*

A. Replying to your inquiry about the effect of locust trees in supplying nitrogen to crops grown amongst the trees or after them, I will say that I know of no definite investigations of this kind but I have seen many instances of marked effect of this kind. I remember the last time I was at Montgomery, Ala., I went out to visit a plantation. There was a row of locusts through a large field in which the cotton looked like it might produce a bale or more to the acre. This strip was about ten feet wide, shading off till at a distance of about 25 or 30 feet from the center of the row the effect was no longer visible. Outside of this strip the cotton would not produce more than a quarter of a bale to the acre. The appearance of the strip was so noticeable that I inquired as to the cause.

The owner of the plantation said: "That is where I used to have a row of locust trees; they always do that." This is a typical instance of several similar ones I have seen.

I may add that Mr. O. F. Cook, of this Bureau, who has given a good deal of attention to tropical agriculture, has observed that in coffee plantations it is a common practice to allow certain leguminous trees to grow here and there. The planters formerly attributed the favorable effect of these trees to their shade, but they had noticed it was the shade of only particular kinds of trees that had the effect. It was observed that in every case the trees favored by the planter belonged to the leguminosae family.

These instances lead me to believe that locust trees do have an important effect in supplying nitrogen to nearby crops or to crops which follow.

W. J. SPILLMAN,

In Charge Office of Farm Management, Bureau of Plant Industry, Washington, D. C.

Q. We set out in Century, Fla., during the past eight years some sixty to seventy-five water oaks for shade trees and these trees have been doing nicely up to the last year or two, but we now find quite a few of them suffering from some kind of a Borer, some insect that works its way around under the bark, sometimes making a circular path 15 inches long, or even longer than this, then, at apparently about the beginning of spring, works its way into the very heart of the tree, thence up to the

heart for a few inches, thereby causing the trees to bleed or lose sap.

The insect in question makes a hole in the tree, as it bores into the heart, about one-half inch in diameter, and the path that it makes around under the bark before starting into the heart varies from 1 inch wide to as wide as a man's hand.

These trees are native of this country and the young trees were gathered from adjoining lands.

We will thank you for any information as to how to handle or control this pest and any suggestions you can make us will be gratefully received.

ALGER-SULLIVAN LUMBER COMPANY.

Century, Fla.

A. In reply it is quite necessary as a basis for giving you the desired information that we should have specimens of the borer or of the bark and wood showing the character of its work. The description indicates that two or more species of insects may be involved, one with the bark-boring habit, the other a bark and wood borer. Specimens of work should show injury to living tissue.

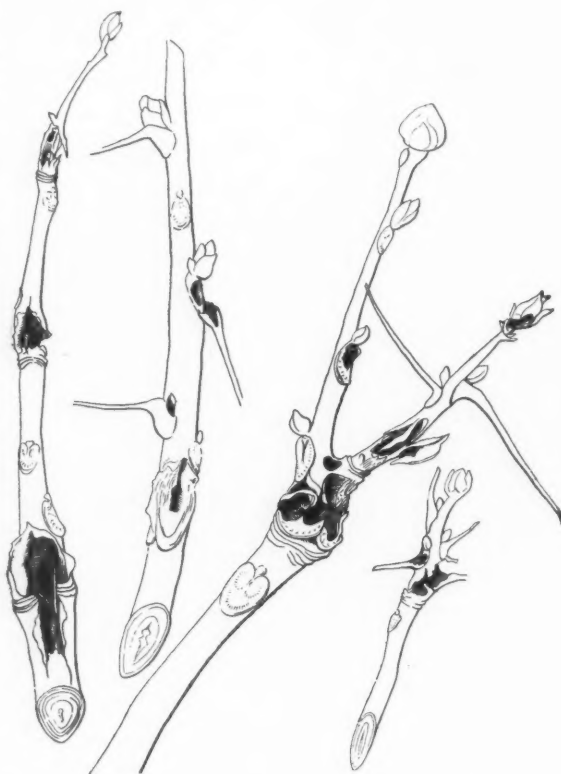
If you will supply the specimens we will take pleasure in giving you information about the insects and methods of combating them.

A. D. HOPKINS,

In Charge of Forest Insect Investigations, Washington, D. C.

ADVICE FOR THE MONTH OF
AUGUST

1. Continue cultivating and watering the newly planted trees and shrubs and those that are weak.
2. Spray for aphids. Beech, white pine, fruit trees and elms are at this time commonly attacked by various species of soft-bodied, sucking insects and the treatment in each case, this month, is about the same—spraying with whale oil soap, one pound to 5 gallons of water.
3. Destroy the pupae of the elm leaf beetle. The elm leaf beetle has the peculiar habit of descending from the branches to the base of the tree in grub form and there changing into pupa form. This happens during the first week in August and those who are acquainted with this remarkable feature of the life history of the beetle take advantage of the opportunity to collect or destroy the pupae when they lie in masses at the base of the tree.



Twigs, buds and base of leaves of hickory trees which have been injured by the hickory bark beetle.

They can be destroyed on the ground by pouring hot water over them or by spraying them with a strong solution of kerosene emulsion. Banding elm trees, so commonly practiced, prevents the grubs from crawling down the trees and defeats the very purpose intended by the bands.

4. Remove the cocoons and egg masses of the Tussock moth and insects of similar habit. These can be scraped off with wire brushes or may be destroyed by an application of creosote on a sponge or rag. The former is preferable.

5. The locust miner is now feeding ravenously on black locust trees and in some cases even on oak, linden, and fruit trees. Spraying the leaves with arsenate of lead, 1 pound to 10 gallons of water will destroy the insects.

6. The white pine weevil may now be found in grub form boring in the shoots of white pine trees. The affected twigs turn yellow and are easily noticeable. Timely removal and destruction of infested branches is the remedy.

7. This is the time when borers may be seen burrowing in peach trees or in oaks, maples and other trees. For those borers that work in peach trees and other trees that exude a gummy substance when injured, employ the method of cutting out the grub with a knife. Any attempt to inject a liquid in the cavity will be hindered by the gummy exudation. For the maples, etc., where the orifice leading to the grub is clear and large, inject carbon bisulphide and clog the orifice with a bit of soap or putty immediately after the injection. The fumes generated by the liquid will enter every crevice of the burrow and destroy the insects within.

8. August is a good time to begin thinning out woodlands where young trees are crowding each other or where young trees of better form are to be encouraged by the removal of surrounding trees of inferior quality. This work can be best accomplished while the leaves are still on the trees.

9. The latter part of August is the period to begin pruning trees and cutting off all dead branches. The distinction between live and dead branches can be made more readily before the foliage drops. The results will be more certain and the work will be accomplished with greater ease and less skill than if it were done in winter.

NOTES

1. The sycamore blight (*gleosporium nervisequum*) has exacted a heavy toll this year, especially on the native species. Complaints have come in from Rome, N. Y., and from all over Long Island. Early spraying with Bordeaux mixture has controlled the blight in Prospect Park this year and four years ago.

2. The hickory bark borer is very noticeable this year as far west as Buffalo, as far north as the Katskills and east in Connecticut. Seven years ago it was serious only in the vicinity of Brooklyn.

3. The forest tent caterpillar has shown itself more numerous this year than ever before. Whole forests were devoured on many parts of Long Island and in Pennsylvania and New York States. The insect is now in its egg state.

4. The moisture conditions have made this season a favorable one for vegetation in the East.

5. Mr. R. Brook Maxwell, city forester of Baltimore, reports a heavy invasion of the army worm in Cecil County and recommends the following formulas for spraying against it:

The first is a preparation of 2 pounds of arsenate of lead in powdered form mixed with 50 gallons of water. This should be applied to the seat of the army worm's efforts. If the lead is used in paste form, 5 gallons of paste are required to 50 gallons of water.

Another preparation that has given excellent results is made from 10 pounds of ordinary bran, one-quarter pound of Paris green, or arsenate of lead and a pint of molasses or other sweet substance such as sugar. This should also be spread over the lawn or applied otherwise to the center of the worm's activities.

The Directors' Meeting

DIRECTORS of the American Forestry Association will hold their fall quarterly meeting at the Profile House, N. H., on September 1 and 2. This meeting will be preceded by a visit to Boston on August 31, where the Arnold Arboretum will be inspected and the party will be met by officers of the Massachusetts Forestry Association and by Boston members of the American Forestry Association.

The directors will breakfast at the Algonquin Club and will leave there for the Arboretum at 9.30. The party will leave Boston at 12.30, reaching the Profile House that evening.

The annual forestry conference in the White Mountains under the auspices of the Society for Protection of New Hampshire Forests and of the State Forestry

Commission, will start on the evening of September 1 at the Profile House and the American Forestry Association directors will attend this gathering and will extend an invitation for the appointment of delegates to be present at the conference with Secretary of Agriculture Houston at Washington, at 9 a. m. on September 22. This conference will be for the purpose of presenting to Secretary Houston arguments in favor of extending the Weeks Law appropriation for the purchase of Federal Forest Reserves in the White Mountains and Southern Appalachians.

It is hoped to have Congress provide an appropriation of \$10,000,000 for this purpose, to be used during the next five years.

Children's Department

Devoted to imparting information about trees, woods and forests to boys and girls so that they may grow to know how necessary trees are to the health, wealth and future of their country.

BY BRISTOW ADAMS

FORESTRY AND WHAT IT MEANS

FORESTRY is the science of making trees serve man's uses continuously. The Forester deals with the woods as mass and not as single trees. He looks on this mass of trees in a good deal the same way that a boy or girl looks at a piece of moss, not taking account of frond or stem, but viewing the growth as a whole.

Not only does the Forester think in large terms as to trees over a great area, but he uses the same large thoughts in respect to time. It is nothing to him to plant a forest growth a hundred years ahead of the time when it will be cut. While the farmer plans for a season and the orchardist for a decade, or a ten-year period, the Forester plans for a century or more.

Yet, in order to know how a large mass of trees must be handled for such a long period of time, the Forester has to know the behavior of individuals, because he, of all men, can least afford to make mistakes. He has to know how each tree grows, and how it will act in relation to other trees. He must know the best use to which each tree may be put, and also how and where it should grow to fit this use. He must know which trees will grow fastest and thus give him quick returns, and which, even though growing slowly, will produce valuable timber. Only through such knowledge can he tell whether it will be best to give his land up to slow-growing, high-priced trees, or to quick-growing ones which will not sell for quite so high a price but which will earlier be ripe for cutting.

WITH the possible exception of iron, there is no manufactured material more useful to man than wood is; it is easily worked and enters into daily life in every conceivable form. We walk on wooden floors and sit in wooden chairs at wooden desks writing our thoughts with wood-encased pencils on paper made of ground wood; then there are wooden window frames out of which we look upon the growing trees that are cut for fuel to warm our houses and cook our food. It is right and proper, therefore, that trees should be cut down and made available for man's use, just as any other crop should be harvested when it is ripe.

Besides growing wood, the forests, as a whole, serve a number of other useful purposes, and have a special influence on water and on soil.

WHEN rain falls on the bare surface it runs off very rapidly. The result is a series of floods and high waters, with corresponding periods of drought and dried-up streams. This condition is not uncommon in many parts of China and in certain areas of our own country where the forests have been destroyed. Mr. Gifford Pinchot, the father of Federal Forestry in the United States, at one time illustrated this point before some doubters by pouring water from a tumbler on the slanting top of a polished table. As might be expected, the water immediately ran off onto the floor. Then, when the table was tilted at the same angle, he poured an equal amount of water on a large sheet of blotting paper placed on the table top. In this case the water was held in the blotter. In exactly the same way the spongy root masses under the trees, combined with the woody soil which has been made up by falling leaves and twigs, and decaying trunks and stumps, holds the rain which comes from the sky.

MOREOVER, even the most driving pelting rains drop gently onto this forest floor because they are caught first by the leaves and branches and instead of falling with the force of a mile-high drop they strike the ground from only a few feet up in the air. Furthermore, a great deal of the rain slips down the trunks of the trees and reaches the ground with scarcely any force at all, to be taken into this blotter-like mass and there held for a long time to be given out through ever-flowing springs.

When a heavy rain falls on a steep hillside and the water gathers force as it goes down, it gullies and washes out the soil, taking away the finer and more fertile particles and carrying them down into the beds of the streams. The finest particles are carried farthest, and in many cases are borne away out to sea, where they form shoals at the entrances of harbors. Thus, this best soil is not only lost to the farmers, but is a serious bar to the passage of vessels, and a source of great expense, because it has to be dredged out of the channels in order that commerce may be carried on.

THIS soil-washing, or erosion, is particularly harmful in the southeastern part of the United States, where the fine soils melt away almost like sugar. One writer on forestry has compared this action

of the water to that of a terrible dragon with steel claws, tearing away at the hillsides and destroying the prosperity of the country. The remedy for this condition—the way to fight this modern dragon—is to plant trees on the hillsides, or to keep enough trees there, if they are already growing, to protect the soil.

It can thus be seen that forests serve two principal purposes: First, as sources of lumber; and, second, as protectors of soils and streams.

IN FUTURE articles something will be told about the way trees grow and about their community life in the forest; how they struggle against one another and how they help one another. After that there will be talks on how to know the common trees.

Perhaps some readers of this department wish now to ask some questions about trees. These questions will be gladly answered. Address them to AMERICAN FORESTRY, Washington, D. C., and the answer will be sent at once.

A Pennsylvania Meeting

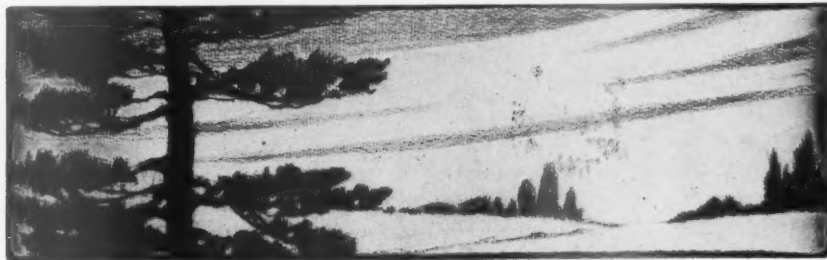
A MOST interesting and successful meeting was that of the Pennsylvania Forestry Association at Foxburg, Pa., on June 23, 24 and 25, where for three days a number of the members and guests inspected forest holdings and heard a series of instructive addresses. Foxburg is on the Allegheny River, 86 miles north of Pittsburgh and is famous as an oil-producing center, perhaps the most noteworthy in the State in the early days of the oil fields' development. Not the least interesting feature of the foresters' trips in the surrounding country was an inspection of oil wells and pumping stations on the Fox Estate and explanations regarding the present phases of the industry and reminiscences of its early days by F. L. Harvey, of Foxburg, and others.

One day was spent in inspecting the primeval forests owned by Mr. A. W. Cooke, of Cooksburg, who has an estate of 7,219 acres some 40 miles from Foxburg, on which there are many magnificent pine and hemlock trees. Here the members of the party tramped for some hours through the woods, finding much to examine and study. Afterward the foresters were entertained delightfully at Mr. Cooke's summer home.

The following day was spent in an automobile trip through the estate of Mr. J. M. Fox, a few miles from Foxburg. Here a well-established planting of some 100,000 young trees was examined with interest and then followed trips to stands of primeval oak, maple, chestnut and ash, ending with a visit to Mr. Fox's residence, where luncheon was served.

During the stay in Foxburg there was a series of meetings, at which the papers and discussions on forestry conditions were of unusual value. These included the following: "Blazed Trails in the Domain of Forestry," by Hon. S. B. Elliott, of the State Forestry Reservation Commission; "A Demonstration Tree Planting at Lehigh University," by Nat. M. Emery, vice-president of Lehigh University, read by Dr. Henry S. Drinker, president of Lehigh University and president of the American Forestry Association; "A Deciduous Forest, an Ecologic and Geographic Study," by Dr. John W. Harshberger, professor of botany at the University of Pennsylvania; "The Transformation of the Actual Forest Into the Normal Forest," by Prof. Joseph S. Illick, State Forest Academy; "Some Criticisms of Pennsylvania's Forest Policy Answered," by Walter D. Ludwig, Forester; "The Immediate Need of Extending State Forests in Pennsylvania," Prof. E. A. Ziegler, director State Forest Academy; "Aims of Central Pennsylvania Fire Protective Association," J. Linn Harris, State Forestry Reservation Commission; "The Relations Existing Between Forestry and Game Interests," Dr. Joseph Kalbfus, secretary Pennsylvania Game Commission.

There were also other addresses by Hon. Robert S. Conklin, chief of the Pennsylvania State Forestry Department; Dr. J. T. Rothrock, formerly a member of the State Forestry Commission; F. L. Harvey, of Foxburg; Hon. John Reed, of Foxburg; Robert H. Wilson, of Foxburg, and others.



Coal Company Practices Forestry

By A. C. NEUMILLER, *Forester*

THE Lehigh Coal & Navigation Co. and the Panther Valley Water Co., one of its subsidiaries, own large areas of forest land in Carbon and Schuylkill Counties, Pennsylvania, approximating 2 miles in width and sixteen miles in length.

For a number of years timber was taken from these lands and used for mining purposes, leaving the forests in an extremely bad condition. No attempt was made to confine forest fires with the result that today, there is a vast area of waste land, covered with sprout growth of

is destroyed by forest fires. An investigation showed that over 60 per cent of the fires were caused by sparks from locomotives; 125 of these locomotives operating daily over heavy grades in and around the company's land, so that it became a matter of extreme importance for the department to establish a system of forest fire protection without delay.

The first step taken in this direction was the installation of proper spark arresters on all locomotives owned by the company and one of its subsidiaries, the Lehigh & New England Railroad Co., operating in this section.

It was also noted that forest fires were caused by hunters, berry pickers and other people, who frequent the woods for pleasure, through their carelessness with matches, etc.

To establish adequate fire protection and to bring about the prompt extinguishing of forest fires, fire rangers were employed and instructed in the most approved methods in preventing and putting out fires.

At this time, there are eight fire rangers, each assigned to a district, where there are natural look-out points and telephones.



CHARACTER OF LAND ON WHICH PLANTING WAS DONE

This land was originally covered with forest, but this was cleared off years ago and the timber used in early mining operations. Since then it has been swept by fire as so much of the land in the Pennsylvania anthracite region has. These fires are followed by a scrubby growth of chestnut, oak and pitch pine.

oak, maple, chestnut and pitch pine, interspersed with good stands of timber, which nature saw fit to preserve.

This condition is not only true of the coal fields in Carbon and Schuylkill Counties, but it is practically true of all the coal fields in Pennsylvania. Realizing the necessity for conserving the timber still growing and reforesting the waste land, the Lehigh Coal & Navigation Co., several years ago, employed a forester to organize a department, whose sole duty it is to prevent a further waste of these resources and to reforest the waste land.

In Carbon and Schuylkill Counties, as well as in other sections, most of the young timber



RANGERS AND LABORERS PLANTING

These planting crews under the supervision of Forester Newmiller during the spring of this year planted nine thousand trees, these being four thousand white pine, three thousand Norway spruce, and two thousand white ash. The planting covered twenty acres and the trees and the work cost approximately \$10 an acre.



REMOVING TURF AND DIGGING HOLE

This is the first operation in the planting of the waste lands of the Lehigh Coal and Navigation Co. The planting crew follows with the seedlings and the operation is quickly completed.

The duties of the rangers are similar to those of the State Forestry Department. During the forest fire season, they continually patrol the property, when not fighting fires. In other seasons of the year they assist in cutting and cleaning fire barriers, building trails, cutting timber, etc. During the spring and fall fire seasons, the force of rangers is increased two and three fold.

The rangers are equipped with fire extinguishers, holding $2\frac{1}{2}$ gallons of chemical mixture. Connected with the extinguisher is a water-proof bag, holding 8 gallons of water, from which the extinguisher can be recharged. We have found this device of great value, particularly in burning fire lines and back fires.

The power transmission lines radiating from the Lehigh Navigation Electric Company's new power plant at Hauto to the coal and cement regions, are kept clear, and thus serve as fire barriers to a good advantage.

On the Broad Mountain barriers 30 to 40 feet wide have been cut through the largest isolated tract to aid in the rapid transportation of labor to fires. Some of these barriers have been plowed, and in time will be developed into roads, which can be used for transporting timber.

There are spots along these barriers where the mountain is so rough as to prevent plowing; at such places two 8-foot parallel strips are cut, leaving 20 feet of uncut brush between the two strips. It is then an easy matter to burn the 20 foot strips each year. This method eliminates the cost of cutting and plowing.

In many instances the fires cannot be extinguished by the ranges, and in such cases the Department procures laborers from the different operations of the company, or when the fire is located at too great a distance from the operations, they procure the service of persons living nearest to the scene of the fire.

The Boy Scouts of America of this section recently organized, the Lehigh Coal & Navigation Co., lending its moral support, take considerable interest in the prevention and extinguishing of forest fires. It has been found that half a dozen enthusiastic Boy Scouts from fourteen to eighteen years of age, can get to a forest fire and put it out before other ordinary labor arrives.

Farmers and adjoining land owners cooperate with the Lehigh Coal & Navigation Co. in the work toward the prevention of unnecessary losses due to fires.

The following table, showing a comparison of fires during 1914, the first year of the department's work, with that of the year preceding it, shows a marked improvement in the losses, notwithstanding the fact that the dry weather conditions during the forest fire seasons in the year 1914 increased the number of fires 50 per cent.

	1914	1913	Change
Number of fires.....	102	68	+34
Area burned, acres...	1420	15000	-13580
Cost of extinguishing	\$882.71	\$1912.70	-\$1029.99

Attention is called to the fact that while the number of



PLANTING THE WHITE PINE

Most satisfactory results were obtained from this planting. Here the planter is banking up the earth around a four-year old transplant which is so hardy and strong that only a small percentage fail to grow.

fires in 1914 increased 50 per cent the acreage burned was less than one tenth of the 1913 figures.

As previously referred to, there are a number of stands of good timber scattered through the Company's land, consisting mostly of mixed hardwoods, a large percent-

age of which are mature, over-mature and defective. The clearing of the stands of matured timber naturally develops the other standing timber.

The expenses of the Forestry Department are derived from the sale of over-mature and mature timber to the mining operations of the coal company. Revenue is also derived from the sale of timber from mine crop falls and from timber cleared from sites used for dumping refuse or for dumping of clay at the stripping operations.

It is the duty of the department to see that no useful timber is wasted. Timber cut from the company's land can be delivered to the mining operations at about one-half the cost of timber purchased in the open market; notwithstanding the fact that some of this timber has to be transported from the mountain sides, a considerable distance from the colliery operations. The freight haul on mine timber, purchased in the South, where most of the company's supply is obtained, is about one-half the total cost of the timber.

The lands of the Panther Valley Water Co. were acquired principally for their sources of water, necessary in the operation of the mining plants, as well as for domestic use. Due to the remoteness of this land from towns it has been neglected from a timber standpoint.

Recently an 80,000,000 gallon reservoir, domestic supply, was completed by the water company on one of its water sheds, and it has been decided to have this land reforested.

The location is in the Broad Mountain, a plateau ranging from 900 to 1,800 feet above sea level; the soil is light, deep and sandy, with a porous sub-soil varying to moist clay flats, which are not continuously wet.

The present sprout growth of chestnut, oak and pitch pine have been ravished from time to time by fire. With proper protection, this growth can be developed into good mine timber.



THE FINAL OPERATION IN PLANTING

After the earth is carefully tramped down the seedling is left to take care of itself and then it will not be many years before it is growing at a rate of 10 to 15 inches yearly.

A survey of the territory shows many small patches called "holes" occurring all over the water shed. These holes vary in number from 200 to 600 per acre and are lacking of any growth, except sweet fern and moss.

These holes are being planted with nursery stock of evergreens, and the sprout growth of hardwoods are being developed. To determine the best species, a trial tract of transplants was planted with the following results:

Per Cent Success

White Ash	95 1/2
White Pine	87 2/3
Norway Spruce	82
Pitch Pine	76 1/3
Scotch Pine	66 1/2
Red Pine	57 3/5

In all cases except white ash the transplants were in mixture.



WHITE PINE AND WHITE ASH HEELED IN

Greater success followed the planting of these two species than any other and most of the replanting on this land in the future will be done with them. Over 95 per cent of the white ash and over 87 per cent of the white pine planted proved successful.

Due to the high percentage of success with white pine, Norway spruce and white ash, it has been decided that future planting will be confined to these three species, the Norway spruce and white pine in mixture.

During the spring of 1915, 9,000 trees, consisting of 4,000 white pine four-year transplants, 3,000 Norway spruce three-year transplants and 2,000 white ash one-year seedlings, were planted.

The white ash is planted in the creek bottom lands, while the evergreens are confined to the sloping lands above.

The planting of the 9,000 trees referred to cover approximately twenty acres and the work was done

chiefly with ordinary labor and fire rangers. The total cost of the trees and planting was less than \$200, or approximately \$10 per acre.

A forestry department, such as outlined above, can be maintained from revenue derived from the sale of timber previously wasted, and the incalculable benefit from systematic reforestation and the conservation of growing timber is not only of great importance to the water shed, but will yield a handsome source of revenue in the future, and at the same time will slowly change the present mountain sides, almost barren of tree growth, to a thriving forest.

North Carolina's Action

MEMBERS of the North Carolina Forestry Association, at their meeting at Montreat, N. C., in July, passed resolutions earnestly advocating the continued purchases of forest reserves in the White Mountains and Southern Appalachians and the appropriation by Congress of \$2,000,000 a year for this purpose during the next five years.

These resolutions stated that as the purchase of mountain lands in the East, under the Weeks Law, is of national benefit in securing a perpetual growth of forest on the watersheds of navigable streams, thereby preserving water-powers and navigation on these streams as well as a continuance of a timber growth for industrial purposes, and, as under recent legislation these lands are open to the public for camping and residence purposes, thus affording facilities of great value for pleasure, health and recreation, that Senators and Representatives in Congress be urged to give their support to the recommendation of the National Forest Reservation Commission for a further appropriation for this purposes.

The North Carolina association also commended the action of the American Forestry Association in calling a meeting at Washington, D. C., on September 22 to present to Secretary of Agriculture Houston arguments in favor of Congress making an appropriation for the purpose of Eastern forest reserves. Delegates will be appointed to attend this meeting.

It was also decided to urge additional Congressional appropriations for assisting the States in forest fire protective work and to urge a law giving the Federal Government authority to establish game preserves on Federal Forest Reserves in North Carolina.

The program of address covered practically every phase of forest conservation and was most interesting and the attendance was large.

As a result of the conference on forest fire protection it is expected to have several cooperative areas started in the western part of the State during the coming fall.

Danger Season in the West

FEATURES of forest protection in the Pacific Northwest this year are an appeal to the public for assistance in preventing the smoke nuisance which will otherwise prejudice the stream of visitors going to and from the San Francisco Exposition and a perfected system of dry wind forecasts by the U. S. Weather Bureau which will be used by all protective agencies. State officials and chambers of commerce are sending out thousands of letters emphasizing the importance of reducing the smoke evil.

Reports for June received by the Western Forestry & Conservation Association, the clearing house for all private and official patrol systems from Montana to California, record practically no losses by forest fires up to date, but no cessation of preparation for the danger

months of July and August. Most of the patrol force is already on and within a few days over 2,000 will be on duty in the four Northwestern States. Favorable weather in June has been used in pushing the building of trails and telephone lines.

July hazard that had to be guarded against, other than from the usual carelessness with matches, cigarettes and campfires, was chiefly in slash burning to clear land and rights of way and in leaving fires thus started to smolder in logs and stumps to break out later in hot windy weather. Forest officers announce that State laws prohibiting burning without permit and precaution will be enforced rigidly and also warn summer camping parties to be extremely careful with campfires.

Yale Forestry Class in the Woods

By JAMES L. GOODWIN

ONE morning early in March, thirty of us, enthusiastic Yale Forest School seniors, awoke to gaze from the windows of our special sleeper at the little mill town of Clarks in northern Louisiana, upon which the sun was shining with a warmth and brilliance which we had not felt for many weeks. This town and its surrounding woods was to be our home for three months, and here, according to the annual custom of the Forest School, we were to put into practice the principles of forestry acquired in the lecture room and learn from the actual operations in the woods and the mill how the tall pine trees of the forest are converted into lumber for our towns and cities.

We were not long in starting on a tour of investigation of our new surroundings. The first point of interest that attracted our attention was the general supply store, over whose wide doorway was written in big letters, "The Louisiana Central Lumber Co., and in and out of which sauntered in leisurely southern fashion long, lanky lumbermen and negroes, while a group of farmers whose horses were hitched to various trees and posts in the vicinity stood on the front steps and discussed the crop and timber output and vigorously chewed tobacco. Next to the store stood the hotel, a large white building, with vine-covered verandas reaching to the roof and a small green lawn in front, surrounded by a picket fence, and in which a row of rose bushes was already beginning to show signs of life. In front of the hotel ran a broad, dusty roadway which, before it ended in the pine woods a half mile beyond, was lined on each side by small, one-storied houses where the mill employes lived. A library building, a less pretentious church and a two-storied wooden house that was used as a dispensary and infirmary completed the list of buildings on Clark's main street. Adjoining on the left and covering as much space as the town, stood the sawmill, its long alleyways piled high with various sizes and grades of yellow pine lumber, its tall chimneys and refuse burner emitting black smoke, and the ever-busy saws on its mill floor and in its planing shed sending out to the warm air a continuous buzz and hum.

After hastily swallowing a scanty breakfast at the hotel, we embarked on the special train, consisting of a caboose and engine, which the company had provided, and were taken 8 miles over the logging railroad to the site which had been selected for our camp.

A half hour's run brought us to our destination and



CAMP OF THE YALE FOREST STUDENTS

Here in the depths of the lonely Louisiana pine woods, the boys made their camp of fifteen canvas houses, including a cook shanty and bunkhouse, each tent being fitted with a wooden floor and made thoroughly comfortable.

we landed bag and baggage. Here ground had been cleared and a cook shanty and bunkhouse built, and at once we set to work laying floors with lumber that had been provided by the company, and raising tents, so that by nightfall this lonely spot in the depths of the pine woods was suddenly transformed into a settlement of fifteen canvas houses.

Next day work began. It was divided into two parts: the forestry work and surveying, and a study and written report on the lumbering operations in the woods, and on the work in the mill at Clarks.

For the first six weeks surveying with transit and level was carried on over the neighboring roads within a radius of 12 miles, while in the woods land lines were run by crews of six with a chain and surveyor's compass to re-establish old section and township lines and corners. Later a timber estimate was made by sections of an area of approximately 50 square miles, and a map



VIRGIN LONG-LEAF PINE

was drawn showing the forest types, roads, fields, streams, houses and contours.

"While you are walking through the woods," said the professor in charge, "learn to distinguish between the three species of pine growing here." The long-leaf pine, with its long, thick needles growing in plume-like bunches, bark in long, thin plates and enormous cones which lay scattered on the ground at its base, was not hard to pick out, but the loblolly and short-leaf pines, which grew in greater abundance and possessed smaller needles and cones, could only be distinguished from one another by the difference in size of their bark scales.

In the swamps and along the bayous grew many different species of southern hardwoods; Spanish, Black Jack, white and Texas oaks, black and red gum, the winged elm, with its curious cork-ridged branches, and growing out of the bayous; the south-

ern bald cypress, surrounded by the root-like growths protruding from the water, known as "knees."

Under these tall trees grew a dense and tangled underbrush of shrubs, bushes and vines, often covered with sharp thorns and spines that made traveling through these woods frequently of the greatest discomfort and inconvenience, and destructive to both clothing and temper.

At first the nights were cold and the days hot. The thermometer at noon frequently rose to 85° in the shade, while at night it fell to 40° and below. During these nights four or five blankets and a sweater were none too warm, and at 6.30 in the morning it was a shivery crowd of foresters that peered from the flaps of their tents, and, after a hasty toilet, ran down to the cook house for breakfast.

Every other Saturday was a holiday and when these long-looked-for days arrived, those of us who had grown tired of camp life and wished to get a glimpse of civilization would shave and change our old flannel shirts, khaki trousers and high boots for a collar and necktie and presentable clothes, and ride into Clarks on the log train.

Sunday was spent either in Clarks, where we would sometimes go to hear the old Baptist minister exhort his congregation in eloquent, and often violent language, or out at camp, where we could take long walks or go fishing in the bayou.

The study of the lumbering operations going on all around us occupied two weeks. An inspection and detailed study was made into the methods, equipment and cost of logging from the felling of trees in the woods to their transportation to the mill at Clarks. This included the building, equipment and maintenance of the logging railroad. Later, in



HAULING LOGS WITH A MULE TEAM

Part of the course of instruction to the Yale Forestry students in summer camp consists of inspection and detailed study of the methods, equipment and cost of logging from the felling of the trees in the woods to their transportation to the mill.

addition, another two weeks' investigation was made in Clarks of the methods of mill stocking, the arrangement and equipment of the manufacturing plant, the manufacture of rough and finished lumber and the system of grading lumber.

Our camp was situated within half a mile of where lumbering was being carried on. A walk through the pine woods led to a railroad spur, where the freshly cut stumps, covered with yellow, sticky resin, the piles of huge pine logs and the disorder of tops and branches lying in all directions indicated that only a short time had elapsed since the lumbermen had been busy in this district with their saws and axes. Nor had they proceeded in their work to any great distance. From out of the woods where the tall, rough barked pines still remained standing, came the ringing blows of axes and the sound of cross-cut saws. Occasionally an old veteran would begin to tremble, then slowly lean to one side and, falling faster and faster, strike the ground with a crash that shook the ground in the vicinity and could be heard for several miles around. The fallen tree would then be sawed by the sawyers into 16- to 20-foot logs, which were subsequently loaded onto eight-wheeled wagons and slowly hauled by mules or oxen to the side of the track, where they were piled on a skidway, ready to be hoisted to the log cars by the log loader and carried off to the mill.

The lumber camp was another object for investigation. This little settlement bore the name of Oakland and consisted of thirty or forty wooden portable houses, a store for supplies and stables for the mules and oxen, and was situated on the main logging railroad. Each house consisted of one story and two small rooms about 12 by 12 feet, and housed the lumbermen and, in many cases, their wives and children. They were owned by the lumber company and were rented out to the men at



TO CLARKS, LA., ON THE LOGGING TRAIN

Clarks is in northern Louisiana and it was near the little village that the Yale Forestry students spent a busy summer doing practical work in the woods.

a monthly rate of from \$2 to \$3. At the little store and postoffice, also of the portable variety, such a miscellaneous supply of goods were to be had as hats, shoes, canned vegetables, fruit, candy and tobacco.

As one examined the men who lived and worked there, he could not but realize what a thin, unhealthy-looking lot they were, often very tall, but slim and narrow-chested and with constitutions undermined with malaria or subject to attacks of pneumonia, which frequently proved fatal.

In our own camp we led a regular and, until the arrival of the extreme heat in May, healthy life. Breakfast was at 7 and at 8 everyone was supposed to be dressed for the woods, and equipped with lunch, water canteen and whatever instruments that were necessary for his especially assigned work for the day. Surveying and traverse work required transit, level and traverse board and was conducted on the roads. Timber estimating, on the other hand, required calipers and



GETTING LOGS ON THE CARS WITH A LOG LOADER

The work of the Yale Forestry students in the woods included the building, equipment and maintenance of the logging railroad, an eminently practical experience.

height measurers, and was conducted in the woods. Most of the latter work was carried on several miles from camp. The road to one of the heavily timbered regions led for 2 miles through pine woods downward to the valley of the Castor Bayou. No good roads association had yet been organized in this part of Louisiana, and the highway along which we walked was dignified by the name of road. It was a rough and rugged enough trail on which to travel by foot, but when one risked his peace of mind in a wagon on this thoroughfare, as most of the farmers had long ago accustomed themselves to do, he was indeed brave. Sometimes the wheel track on one side would be 2 or 3 feet higher than the other, sometimes a tree would fall across and bar the way, and after a heavy rain storm it was no uncommon occurrence for the swollen streams to cover the roads to a depth of 2 or 4 feet, so that the wayfarer who drove or rode on horse or mule would be compelled to swim his beast across.

Before reaching the Castor Bayou, we passed two or three small farms. These stood in clearings and were surrounded by ploughed fields in which the stumps and dead trunks of girdled pine trees still remained, the owner not having sufficient energy to cut them down. Fat razor-back hogs snuffed and grunted around the front door or lay sunning themselves in the dust of the road, and sometimes a disagreeable bloodhound ran barking to the gate. The houses were small, wooden shacks of two or three rooms, where the farmer and his family lived the year round. Extreme poverty and ignorance appeared to be universal in this region, and even the largest and most prosperous land owners lived amid conditions that would be tolerated nowhere else.

As we approached the river valley the pine trees became smaller and less numerous, and oaks and gum trees took their place. At this season the woods were white with the blossoms of the flowering dogwood, whose branches appeared in the rest of the foliage like small scattered clouds. The jasmine vine too covered bushes and shrubs with a mass of yellow blossoms which gave forth a sweet heavy perfume.

The Castor Bayou was a small stream which we crossed on a long iron bridge. Out of its brown, muddy waters grew tall, straight cypress trees surrounded by their rootlike knees which protruded above the surface; Spanish and white oaks, sweet and sour gum trees and winged elms grew on the banks, and under them the thick underbrush and the bushes, which later bore the little red "May haws" or "May apples," were beginning to turn green.

After leaving the bayou, our road led out through a flat open country, bordered on each side by wide fenced-in pasture lands, where horses and cows and hogs were

feeding. Frequently we found here rows of large, skinny necked turkey buzzards lining the top fence rails and silently watching for an unsuspecting chicken to make its appearance in the fields beyond or a fat young razor-back to wander from its mother's side.

We soon diverged from the road and after crossing a stream, several fences and some open fields, again entered the pine woods. We had not far to go before we found what we were looking for—a large fresh blaze cut in the bark of a young pine tree on which was written in black letters "1320." This marked the quarter section previously measured and blazed and marked the spot where that day we were to begin timber estimating. All morning long we walked back and forth in the quarter section in carefully sighted compass lines north and south, measuring the diameters and heights of the pine trees.

At noon we found a shady spot and stretched our weary limbs on the ground and ate lunch. It was then that the active ticks and jiggers began to discover us and it was much better at this time to discover a small round brown tick traveling up one's trousers than to have to pull the head out later which the tick, if possible, firmly burrowed into one's leg. Lizards and chameleons also disported themselves on shrubs and trees, rustling about among the dead leaves or darting down the trunk of a tree and running out on a log where in a warm bright spot they would sun themselves, turning from a dark brown to a vivid green and ever keeping on the alert to snap up a palatable looking fly.

After an hour's rest, we resumed work, keeping at it until 4 or 5 o'clock. The time for quitting work, however, was a variable one and as every one was supposed to be back in camp at five, it usually depended on the distance that intervened and whether one could walk at the rate of three to four miles an hour. If a heavy tropical thunder shower suddenly took a crew unawares, as was sometimes the case, a record time was made back to camp, but usually the warm weather did not admit of very fast traveling.

Occasionally the work was carried on in districts situated at such a considerable distance from camp that we were forced to beg a night's lodging at the nearest farm. On account of poor food and sleepless nights, due to unseen occupants of our beds that we usually encountered at these houses, we did not look forward with the keenest anticipation to these distant trips. But back at camp again, after a good supper, while some smoked and others played guitars or mandolins, with the whip-poor-wills and tree frogs joining in, we forgot we were way down in the forests of Louisiana; we forgot the heat and long dusty roads, and the life of the forester and all it stood for seemed worth while once more.

Editorial

THE ENLARGED MAGAZINE

WITH this issue the AMERICAN FORESTRY MAGAZINE makes a departure from the form it has had for the past twenty years—a change which it is hoped will greatly please the members of the association and render the magazine of still greater value to them in the future. Not only is the enlarged size more attractive in appearance and more convenient to handle and to read, but it permits larger and better illustrations, so desirable in presenting pictures which are of value in impressing upon the mind the essential points of the articles they illustrate.

Public education in forestry and in a knowledge of trees is so necessary to the success of the movement for forest conservation and for proper care of ornamental and shade trees that AMERICAN FORESTRY will present each month a series of instructive articles designed to further this necessary public knowledge of forests and trees. The cover of the magazine will have a picture in colors of the particular tree being described, so that identification of it may be readily made, and there will follow articles on its appearance, characteristics and its commercial uses, so that the readers may acquire a

personal knowledge of the best-known trees, a knowledge which will not only be desirable but beneficial to them. There will also be special departments on forestry for children, which will be interesting for adults as well; on birds, without which to wage war on insects there would be no trees or other vegetation; on wood preservation, which has such an important bearing on forest conservation, and on ornamental and shade trees, about which there is such a rapidly growing public desire for knowledge.

In addition to these features, there will be the usual timely and important articles upon various phases of forestry, articles which will keep the members informed of forest conditions not only in the United States and Canada but all over the world.

Appreciation of these improvements in the magazine is, of course, expected, but what is most desired is such substantial appreciation as an increase in membership in the association. This may best be secured by the present members telling their friends about the association, its work and its magazine, and nominating them for membership.

ONE-THIRD OF OUR LUMBER WASTED

ONE of the vital essentials in the conservation of the forests is the utilization of as much of the tree cut down as possible. The fact that, with lumber conditions as they are, 30 per cent, or almost one-third, of the timber cut is left in the woods to waste makes it apparent that a reform in the lumber industry is absolutely necessary to prevent a great natural resource being shamefully dissipated.

Reduced to figures, this waste means an annual loss of fifteen billion feet of timber, or practically one year's total consumption of timber every three years.

This fact was presented to members of the Federal Trade Commission in Chicago in July by President R. H. Downman, of the National Lumber Manufacturers' Association in describing the condition of the lumber industry. Mr. Downman and a number of other leading lumbermen were invited by the Commission to tell how severe the depression in the lumber industry is, what has caused it, and suggest measures for improvement.

Perhaps no business in the United States has suffered so greatly in the last several years as the lumber business and perhaps for none is the outlook for the future more cheerless. It is therefore of prime importance that some action be taken to revive it. The Federal Trade Commission has indicated its desire to aid in this

and the meeting was the first of a series at which the members of the Commission will hear facts concerning the industry and consider the remedies suggested. What may result from this is not yet apparent, but the opportunity to present their case has been given to the lumbermen and it is up to them to cooperate with each other in the endeavor to decide upon some legal, practical plan by which their business may be saved and by which it may be possible for this great industry to regain the place it formerly held.

What this industry means to the United States may be judged by Mr. Downman's statement that:

"We are here today representing an industry which has an investment of practically two and one-fourth billion dollars in the way of raw material and development—an industry which is the third largest in the point of employment of all industries in the United States, engaging 695,000 men, upon whom are dependent 3,475,000 people."

How the extreme depression of the lumber industry results in waste of the forest resources was described by Mr. Downman when he said:

"The condition of this business in the last eight years has been one of demoralization. Practically little or no profit has been made during that period. At the present time an actual loss in the business is

occurring, not only of profits, but an unavoidable, but nevertheless shameful, waste of forest resources. In some instances it will be demonstrated that the assets being converted into lumber are being sold on a basis which yields the owner nothing. This situation is due, more than any other thing, to overproduction and uncontrolled competitive conditions.

"The price of lumber has gotten so low that a very large portion of the tree cannot be profitably manufactured. As a result of this condition 30 per cent of the cut is permitted to stay in the woods to waste. Based on the production in the United States for 1909, practically fifteen billion feet of timber is wasted annually, which in a period of a trifle over three years, is one year's total consumption of lumber."

The public has a very definite interest in the situation, an interest which deserves most serious attention, an interest appreciated by the lumbermen, and the guarding of which is one of the prime objects of the American Forestry Association. Of this interest, President Downman said to the commission:

"It is not alone our own business interests that are being sacrificed on the altar of unlimited and uncontrolled production of timber products, but, indeed, the broader interest of the public itself is involved. The wicked and needless waste of a prime, natural necessity would be impossible in any other civilized country in the world. With us waste results from fear of law; in Europe waste is made impossible by law.

"The suggestions to be made to this honorable body by these business men will in no way encroach on the anti-trust laws of our nation. It is not our purpose to urge a course of action that runs counter to the fine spirit of justice that illuminates the interpretation by our courts of these laws. The *Rule of Reason* is the very essence of the thought we seek to present. At the base of all laws is to be found the purpose of conserving public welfare. This is the ultimate view of our courts in analyzing the purpose of our anti-trust laws. We, as business men, although wishing to benefit our own interests, seek by the suggestions to be made to this commission to so order our affairs that self-interest will not obscure public welfare."

Of the causes that contributed largely to the depression in the lumber business, Mr. Downman said:

"The railroad industry, one of the largest consumers of lumber in the United States, has not been in the market normally since 1907, and we estimate that their consumption today does not exceed more than 50 per cent of normal consumption.

"The export business, which consumes 10 per cent of the production of lumber, has practically ceased on account of the war. In the summer of 1914 building operations stopped by reason of financial conditions.

"All of these causes, coupled with uncontrolled output, contribute to produce the demoralizing con-

ditions that have for a long period existed and still exist. Prices have gone to pieces, wage scales have been universally reduced, and bankruptcy has overtaken a large number of individuals engaged in the industry.

"To this statement there is appended a compilation of data taken from Dun and Bradstreet covering a period of five years. This data gives a vivid and tragic picture of the financial ruin that has overtaken a large number of the lumber manufacturing interests and the impending threat to all such interests."

The data referred to shows that in the last five years 2,253 lumber firms, the liabilities of which amounted to \$85,756,280, have become bankrupt.

In conclusion Mr. Downman made the following appeal, after which further evidence, in detail, was presented to the commission by other leading lumbermen:

"We earnestly urge the commission to make the fullest possible investigation of our trade conditions—and this for the reason that we feel that if this body becomes thoroughly conversant with the industrial and economic situation as today exists in the lumber manufacturing business, you will, not only permit some plan for relief, but of your own initiative, urge such a course."

It has been variously estimated that the timber supply of the United States, at the present rate of cutting and present extent of re-growth, will be exhausted in from fifty to a hundred or hundred and fifty years. With a knowledge of all that forested land means to the health, wealth and prosperity of a country, how vitally important it is to overcome a condition that permits 30 per cent of the timber cut to be wasted. How much it will mean to future generations if industrial and economic reforms which will prevent most of this waste are adopted. It is possible by wise regulation of output and proper adjustment of prices to provide for the utilization of much of the timber which is now wasted. Such utilization would add scores of years to the life of the forests.

Nor is this all that is necessary. The forests should be perpetuated. Their ultimate elimination in one hundred years or in one thousand years will lead to just such conditions as today exist in China, from whence, at this writing, news dispatches announce the loss of 150,000 lives on account of unprecedented floods. Had China's forests not been destroyed, such floods would not be possible. In a lesser degree, but at the same time strikingly impressive, is the report of flood losses in Ohio aggregating \$1,000,000. It is the loss of forest cover which in great measure results in flood conditions.

With all there is at stake both as it concerns business conditions and conservation of the forests, the decision of the Federal Trade Commission will be awaited with eagerness and anxiety.

Wood Preserving Department

The Modern Application of Wood Preserving Methods—Various Treatments and the Uses of Treated Woods

By E. A. STERLING

[In this department each month will be given the best information regarding all phases of wood treatment by preservatives and the uses and values of treated woods, this having become an essential feature of conservation. The Editor will welcome any inquiries.]

THE universal use of wood makes the modern practice of preserving it against decay of wide interest. The saving which is effected, and the extension of the use of wood because it can be made permanent, concerns the consumer, the lumber producer, and the wood preserving interests on common ground.

The decay of timber has been a problem since time immemorial, yet wood so far surpasses all other structural materials in workable qualities, availability, beauty and convenience that it has held its own through all the years. Under modern competition with other materials it still retains the leading place, and by proper preservative treatment as now developed the renewals necessitated by decay can be greatly reduced or eliminated. Permanence and improved service become a matter of knowledge. Information on the subject should be extended so that treatment can be applied where it is economical or otherwise advisable.

In this country the extensive commercial application of wood preserving methods is a twentieth century development. It is true that the first plants were built nearly forty years ago and crude treatment applied even earlier; yet only during the last fifteen years has there been rapid advancement. In Europe wood preservation has been an accepted practice for three-quarters of a century, with the recorded experimental use of many preservatives and processes extending back to 1657. Even in the dim ages of Egyptian supremacy, it is apparent that ways and means had been found for preserving animal and vegetable tissues indefinitely; while during the early Greek and Roman civilization oils were applied to preserve their statues and bridges.

The modern application of wood preservation depends on the economic advantages and on knowledge of the possibilities and methods. During the years of rapid industrial expansion and of cheap and abundant supplies of lumber it was cheaper to renew the wood which decayed than to incur the greater initial expense of making it permanent. These conditions no longer hold, hence the adoption of wood-preserving processes, first by railroads for cross-ties and bridge timbers; later for a great variety of construction timbers which are subject to decay. The next step is to the home builder and retail trade.

Despite the fact that several hundred different materials have been tried and advocated for preserving

wood, the cheapest and most effective in use today have been known and used for many years. These are coal tar creosote and zinc chloride, each having been brought to us from Europe. Strangely, both were invented or proposed in England in the same year—1838. New preservatives are continually being produced and promoted, and while some of them have merit, the two old standards remain supreme in point of consumption and general acceptance. The test of time is the essential proof of efficiency, and other preservatives may ultimately make good. To merely prevent or defer decay is not enough; the ideal preservative must be permanent, penetrate the wood readily, and not be too costly.

The nature of decay is understood by scientists, but is not of general knowledge by the public or even by everyone interested in the wood-preserving business. As applied to wood decay is caused by vegetable organisms known as fungi. These propagate by means of microscopic spores, which are equivalent to the seeds of plants. Being produced in enormous numbers and blown about by the wind, they are present everywhere. When they find lodgement on wood they develop a growth of microscopic threads which penetrate the tissues of the wood and cause disintegration. After a period of growth they produce fruiting organisms which constitute the common fungus growth seen on decayed wood.

In order to develop, the fungi must have moisture, favorable temperature, air supply, and food. The latter is furnished by the wood itself and the other factors are present in practically all outdoor conditions. Preservatives prevent the development of the organisms of decay through the double function of being antiseptic or toxic and killing or poisoning the spores, and by at least partial elimination of moisture. The antiseptic feature is probably the most important and while inert oils, which to an extent waterproof the wood, will prevent decay for a time, they are not certain or permanent in their action. Coal tar creosote is both antiseptic and moisture excluding to a marked degree. It also has the further advantage of permanence. Zinc chloride is effective mainly through its poisoning action to low forms of vegetable growth and from our present knowledge is of greatest efficiency in regions of low rainfall or in dry situations.

Preservatives are applied to wood in several different ways, the more common forms of treatment being pres-

sure, open tank and brush. They are efficient in the order named.

The pressure treatment in large closed cylinders gives thorough impregnation of the wood, which protects all portions and makes the preservative less liable to loss by evaporation in leeching.

The open tank treatment consists of immersing the timber in open tanks containing the preservatives, and by the application of alternate hot and cold baths. Penetration to a considerable depth is obtained.

The brush treatment is superficial, but liberal coatings of hot creosote or similar coal tar derivatives protect the wood from decay to an extent which fully justifies this form of treatment.

The cost is naturally determined by the amount of preservatives used, hence the pressure treatment is adopted for crossties and structural timbers, where permanence rather than initial cost is the determining factor. Choice between the open tank and the brush treatments may be determined on the same basis or by the availability of plants where the more thorough treatment can be given.

The application of preservative methods to industrial needs and the requirements of the home builder will be discussed in more detail in later issues. The railroads

have already demonstrated the economy of using treated crossties, bridge timbers and other structural material. In sea waters infested by the teredo, creosoted piling has prevented destruction of timber from marine borers. On the streets of our larger cities creosoted wood block has been found to be the most satisfactory pavement, and the same materials are now being used for factory floors. It is principally among the small consumers of lumber and on the farms that the advantages of treated material has not been realized.

Fence posts, floor beams, planking and many other kinds of timber used around every home could be profitably treated against decay. An educational campaign which is intended to extend widely the knowledge as to the possibilities and advantages of treated timber is under way.

Essential facts and items of interest will be stated on this page from month to month and at any time detailed information may be obtained upon request from the United States Department of Agriculture, the American Wood Preservers' Association, or the National Lumber Manufacturers' Association. Inquiries may be made direct to these organizations or through the editor of the AMERICAN FORESTRY MAGAZINE.

Forest Reserves Purchased

THE purchase by the Government of 97,888 acres of non-agricultural land in the White Mountains of New Hampshire and the Southern Appalachians has been approved by the National Forest Reservation Commission, bringing the total area so far approved for national forests in the East up to more than 1,275,000 acres. This latest acquisition will involve an expenditure of \$380,000, or about \$3.88 an acre.

The largest parcel is in the Boone purchase area in North Carolina, a block of 36,386 acres, which the owners have agreed to sell for \$1.90 per acre. The next largest is in New Hampshire, a group of tracts comprising 23,518 acres, one of which will close a gap between the tracts already acquired in that region, the price being \$7.21 per acre. The rest of the purchase is distributed as follows:

Nine thousand, seven hundred and twenty-three acres at \$4.96 per acre, in the Monongahela area, West Virginia.

Three thousand and sixty-two acres at \$3.16 per acre, in the Potomac area, Virginia and West Virginia.

Two hundred and sixty-four acres at \$3.50 per acre, in the Massanutten area, Virginia.

One hundred and ninety-eight acres at \$3.49 per acre in the Shenandoah area, Virginia and West Virginia.

Thirteen thousand, four hundred and twenty-three acres at \$2.77 per acre in the Natural Bridge area, Virginia.

Seven thousand, six hundred and ninety-four acres at \$2.89 per acre in the White Top area, Tennessee and Virginia.

Six hundred and twenty-six acres at \$5.55 per acre in the Savannah area, North Carolina.

One thousand, six hundred and fifty-one acres at \$7.28 per acre in the Nantahala area, North Carolina.

Three hundred and thirty acres at \$4.67 per acre in the Cherokee area, Tennessee, and

One thousand and sixteen acres at \$5.33 per acre in the Georgia area, Georgia.

The lands have been examined and appraised by the Forest Service and sales contracts will be concluded with the owners by the Secretary of Agriculture as soon as possible. They will then have to be surveyed and their titles approved by the Attorney General before their development can be commenced as national forests for the use of the public. Practically all of the land is mountainous, non-agricultural, and valuable only for forests. Much of it has been culled or cut-over, but several large tracts are comparatively heavily timbered.

About half a million dollars now remains available of the money which Congress appropriated for carrying out the Commission's plan to acquire ultimately about 5,600,000 acres for watershed protection, timber conservation, recreation, and the other uses made practicable by the establishment of national forests in the White Mountains and the Southern Appalachians.

Forest Notes

A New Course

The College of Forestry of the University of Washington, at Seattle, particularly calls attention to the opportunities for specialization in the business of lumbering, the courses of which are for the first time announced in the catalog this year. They include courses in commercial geography, money and banking, accounting, trade of the Pacific, principles of advertising, and other courses in business and commerce. With the addition of these courses, the School of Forestry is now offering opportunities to the students for specialization in practically every form of the lumber industry.

Forest Fire Warnings

With the opening of the season of fire danger on most of the national forests, the Forest Service is sending broadcast a warning that more than half of the forest fires in the United States are due to carelessness or other preventable causes, starting from campers, railroad locomotives, brush burning, incendiaries, and sawmills.

This statement is based on an analysis of statistics compiled from the forest fire records of the last season, when more than 7,000 fires were reported on national forests alone and approximately 10,000 on State and private holdings in the eighteen States which received Federal cooperation in fire protection under the Weeks law, namely, Maine, New Hampshire, Vermont, Massachusetts, Connecticut, New York, New Jersey, Maryland, West Virginia, Kentucky, Michigan, Wisconsin, Minnesota, South Dakota, Montana, Idaho, Washington and Oregon.

Forest fires destroy millions of dollars' worth of timber and other property every year, and in some years cause considerable loss of life. It has been estimated from the best information obtainable that forest fires last year burned over an area of approximately 6,000,000 acres, with a total loss of at least \$9,500,000.

Autos in the Yellowstone

Secretary Lane has just received an encouraging report from his assistant, Mr. Stephen T. Mather, in charge of national parks, relative to the opening of Yellowstone Park to automobiles on August 1. Mr. Mather states that everyone concerned is now enthusiastic about the change in the regulations under which automobiles will be allowed to enter the park and that Colonel Brett, the superintendent, has worked out a schedule under which it is expected the automobile traffic will not endanger visitors to the park. The Sec-

retary feels that in authorizing the entrance of automobiles to this park a step has been taken in the right direction and that a greatly increased number of people will be enabled to visit the park without increased danger in travel. Mr. Mather's report also states that travel in the park is breaking all records, the total visitors for the month of June being 7,500, and that during the period from June 15 to July 8 about 12,500 people visited the park, and that on July 8 there were 4,000 visitors there.

Summer Camp for Forestry

The forestry summer camp of the University of Maine opened at Camp Lunka so on August 4. This two weeks' course was started in the summer of 1913 in response to a demand for a popular, short, introductory course in forestry. The staff of instructors at the University of Maine are in charge of the work, but it is not a part of the regular four years' professional course in forestry given at the university.

No tuition is charged, but living expenses while in camp are divided pro rata between those in attendance, thus making the expense very light. Tents, blankets and cooking equipment are all provided at the camp. The work consists in lectures, general discussions of forestry problems, and practical field work, the latter occupying fully two-thirds of the time.

In the Adirondacks

One of the best sites in the Adirondacks has been obtained for the 1915 camp of the State College of Forestry at Syracuse through the generosity of George H. Thatcher, of New York. During August the time will be devoted to lectures and demonstrations by graduate foresters, botanists, zoologists and more particularly to field trips which will enable the campers to come in close contact with the forest and its wild life.

Standardizing California Walnuts

Announcement is made by the California Walnut Growers' Association that a by-products plant will be opened in Los Angeles shortly to work all inferior nuts into by-products. This will raise the standard and consequently increase the demand for California walnuts all over the country by keeping from the market the culls, cracked and otherwise inferior walnuts.

Several hundred tons of walnuts will probably be cracked up each season and the association intends to make standard

grades, putting the goods up in the most approved way, believing that it will thus develop a fine business on walnut halves and pieces shelled. The association also intends to introduce this year 25- and 50-cent consumer packages of shelled walnuts.

A million or more cartons, containing 1 and 2 pounds of walnuts in the shell, are also to be put out this season. All cartons will have a diamond-shaped gelatin opening, so the consumer can see the contents.

Re-enters Forest Service

On the recommendation of the Secretary of Agriculture and with the concurrence of the Civil Service Commission, the President has authorized the reinstatement of Edward E. Carter in the Forest Service as forest inspector at \$2,800 a year "without regard to the year limit of the reinstatement rule."

Mr. Carter entered the Forest Service in March, 1905, as a field assistant at \$1,000, and resigned in September, 1910, after having been promoted to the grade of assistant forester at \$2,500.

Philippine Concessions

The Bureau of Insular Affairs of the War Department is in receipt of a cablegram from Manila advising that the Bureau of Forestry of the Philippine Islands has extended until noon, October 1, 1915, the time at which it will open bids for a forest concession covering the area known as the Tayabas-Camarines tract.

The Bureau of Forestry also proposes to grant a concession covering the Tambang tract on the Caramoan Peninsula in the Camarines, and announces that upon the receipt of the first satisfactory application the concession will be advertised and bids invited.

The Bureau of Insular Affairs is prepared to furnish information regarding these forest tracts.

Book Reviews

CAMP CRAFT, by Warren H. Miller, \$1.50, Charles Scribner's Sons, New York City.

This is a thoroughly well illustrated book of 282 pages by the versatile editor of *Field and Stream*, whose contributions to *AMERICAN FORESTRY* are so well known by our readers. Mr. Miller is so well versed in all the knowledge of camping and camp comforts that what he says may be adopted as authoritative. The book contains whatever information may be needed by the lover of the woods, the hunter, the fisher or anyone who anticipates and enjoys life in the open. Besides what information

of camp life may be sought will also be found many suggestions which will add materially to comfort and convenience in the camp.

Chinese Wood-Oil Tree

The adaptability of the Chinese wood-oil tree for cultivation in northern Florida seems to have been proved by recent experiments. A tree at Tallahassee, Fla., bore 2 bushels of the fruit last season. In addition to being an economically important tree, it is a decidedly ornamental one. It bears clusters of white flowers with reddish-yellow centers, and in full bloom resembles a catalpa.

The United States imports annually about 5,000,000 gallons of Chinese wood oil, valued at \$2,000,000. As the demands of the American varnish trade are steadily increasing, this affords a very large domestic market for this prospective new Florida industry.

Fire Protection

The Vermont Timberland Association, the object of which is the protection of Vermont forests from fire, was organized early in July. The principal offices are to be in Bloomfield, Vt. The association will endeavor to enlist the aid of the United States and the State government in the work and will encourage enactment of laws which provide for adequate fire protection.

Any firm, person or corporation interested in the management of timberlands within the State shall be eligible to membership. A board of directors, consisting of five members, will have control and co-operate with the State Forester as far as possible.

The articles are signed by officials of lumber concerns which have large interests in the State: W. R. Brown, of Berlin, N. H., of the Berlin Mills Co.; E. E. Amey, of Portland, Me.; Dalton Power Co., of Fitzdale, Vt.; Connecticut Valley Lumber Co.; Howard G. Philbrook, of Boston, Mass.; A. N. Blandin, Mountain Mills, N. H., president of the East Haven Timber Co.

Forest Land Uses

The scheme of relieving unemployment in Massachusetts by providing a special fund to be spent under the direction of the State Forester has proved to be a complete success, according to the report of Forester Frank Rane, filed with the Governor.

With the \$99,547.55 provided by the Legislature and gifts of \$12,076.87, the State Forester was able to provide work for thousands and at the same time complete a large amount of useful labor on the woodlands and roadsides of the State. The total expenditures from the fund amounted to \$109,623.20 and, counting

gifts still to come, there will be still available \$1,838.37 to complete work partly done.

City's Timber Tract

Having a thirty-day option on the tract of land comprising 5,500 acres belonging to the Bee Tree Lumber Co. and known as the Bee Tree watershed tract, the members of the Board of City Commissioners of Asheville, N. C., have notified the owners of the property that it will be purchased by the municipality in compliance with the terms of the option. The sum of \$30,000 will be paid for the land and it will become the property of the city before the eighth of October.

The land contains a valuable stand of timber and this will be preserved, the property being bought with a view to increasing the present watershed holdings of Asheville.

Wood Waste Exchange

Since the inauguration of its Wood Waste Exchange, on April 15 last, the Forest Service has been requested to list 147 mills and factories as having waste material for sale, while during the same time seventy-six other wood-using concerns have asked to be listed as desiring to purchase waste of a wide range of species in specified dimensions or as mill or factory run. The latter have been included in the list of "Opportunities to Sell Waste," which is sent monthly to concerns which have waste material for sale. This list is growing steadily, but the Forest Service is anxious to accelerate its rate of growth inasmuch as it comprises only about half as many buyers as there are sellers listed under "Opportunities to Buy Waste."

Off for Alaska

Chief Forester Henry S. Graves, accompanied by E. A. Sherman, an Associate Forester, left in the middle of July for Alaska, where they will inspect the national forests there with a view to classification. There are about 78,000,000,000 feet of timber on the national forests there of which 70,000,000,000 is on the Tongass. The woods is mostly spruce and western hemlock.

Private Reforesting

The first private reforestation project in West Virginia will be undertaken by State Tax Commissioner Fred O. Blue on a 400-acre tract of personal property in Barbour County, according to an announcement made by Frank Glenn, of Parsons, W. Va., chief deputy in the State Forestry Service. The land is to be reset in chestnut, poplar, locust and black walnut. Mr. Blue will be given assistance in the undertaking by the United States Forest Service.

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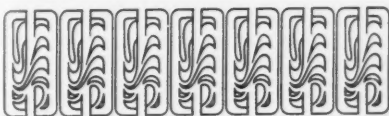
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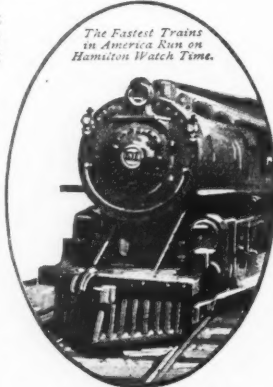
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oratory. Mr. Thomas Adams, of the State tax commission, was toastmaster.

Foresters Meet

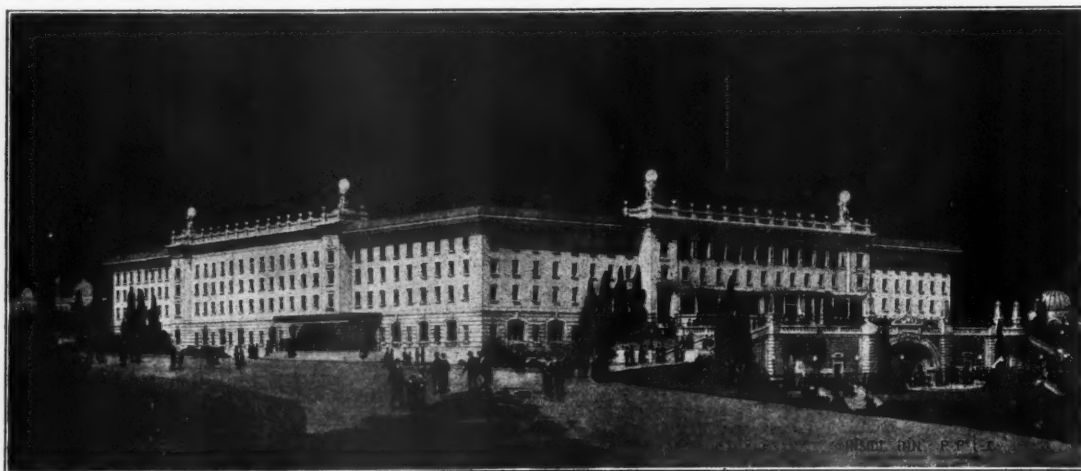
Pennsylvania State Foresters met at Galeton, Potter County, Pa., on August 10, 11 and 12 for their fourth annual summer convention and during that time the annual meeting of the Pennsylvania State Forest Academy Alumni Association was held, with W. Gard. Conklin, of Harrisburg, presiding. The foresters visited Asaph on the Stone State Forest, and Crossfork on the Ole Bull Forest.

At Asaph was seen the State forest tree nursery, where nearly 2,000,000 seedlings are produced annually, and a number of interesting and instructive plantations, among which is an experimental plantation made in conjunction with the Du Pont Powder Co. to determine effects of subsoil dynamiting to stimulate tree growth. Of no less interest were object lessons learned from plantations damaged by ice, floods, landslides, and fires; also plantations made from "culls" and seedlings which are usually discarded, showing good establishment and growth. The best white ash plantation on State Forests was seen.

At Crossfork were plantations of white pine, bull pine, silver pine, red pine, Scotch pine, Norway spruce, Douglas fir, red oak, and European larch. The operation of a

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Dinner for State Forester

A dinner was given for State Forester Griffith at Madison, Wis., on July 16, in appreciation of his service in the cause of forestry in Wisconsin. About twenty

of Mr. Griffith's friends were present, representing a variety of interests. Informal talks were given by President Van Hise and Dean Birge of the University of Wisconsin, ex-Senator Hatten, and Howard F. Weiss, director of the forest products lab-

State Forest telephone system was studied there. Crossfork is an abandoned lumber town and once was almost as thriving as Galeton. The comparison and contrast between the two is a matter of historical and economic interest.

CANADIAN DEPARTMENT

Canadian Department

ELLWOOD WILSON

Mr. Robson Black, the new secretary of the Canadian Forestry Association, has started out to put a lot of life into that organization and we wish to compliment him on the work already done and to wish him good luck with his endeavors. The first number of the *Canadian Forestry Journal* is a great improvement and should be a great help in increasing the membership. It is newsy and interesting and the articles are timely and readable. In the matter of publicity in the press, Mr. Black has also done good work and his idea of sending copies of the papers in which articles about the work of the Association appear to the directors is a most excellent one. A very good article from his own pen in the issue of the *Monetary Times*, of Toronto on "Ontario's Forests and Water Powers" is very interesting and should do a good deal to awaken public interest in this most important subject. The interest taken by the government of Ontario in hydro-electric development has been great and has shown courage and foresight on the part of the officials responsible for it and they will no doubt soon realize that without forests their water powers will be deteriorated and will do something to wake up and put life into the moribund forest policy of Ontario. When the importance of the subject is considered, the present system is little short of criminal.

The Dominion Forests Products Laboratory of McGill University is about to undertake a study of the mechanical properties of Jack Pine. This tree is very abundant throughout Ontario and Quebec and as it is the most rapid in growth of any of the trees native to these provinces, we need all possible information about it. It would seem that it would be a most profitable tree to grow for railway ties, mine props, and fence posts, especially if it could be satisfactorily treated with some preservative. Trees ten years old show a growth of 9 to 11 feet in height with a diameter of 2½ inches on the stump.

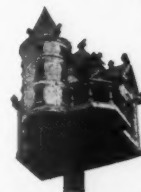
The Minister of Land and Forests, the Hon. Jules Allard, has taken up the question of taxation of lands used for reforestation and will probably bring forward a bill at the next session of the Legislature to regulate this matter, which naturally is of great importance.

The Laurentide Co., Ltd., of Grand Mere, Que., has entered into an agreement with the Parish of St. Jacques de Piles, which provides that the parish will not raise the taxes on lands used on which trees are planted for a period of twenty-five years at the end of which time the

agreement can be renewed. This shows a most progressive spirit on the part of the parish and the company will continue its plantations in this district until all available land is planted. This spring about one and one-half miles of road were built in this parish by the company which it is hoped will serve as models to the farmers and encourage them to improve their roads. Fire lines have also been cut around the plantations and along the roads.

The fire situation in the Province of Quebec has been much improved this year and the number of fires this season will probably be the lowest ever recorded. So far there have been practically no fires set by railroads, and the settlers fires have also been below the average. The greatest improvement has been in the reduction of fires set by river drivers, a special ranger having been placed with each drive crew. In the territory patrolled by the St. Maurice Forest Protective Association only one fire set by drivers has been reported. It is a curious commentary on the state of mind of employees of companies that they should not be willing to do all in their power to safeguard the property of their employers, but such is the case. In this Association it has been extremely difficult to get the full cooperation of the Woods Departments of the various companies who are members of the Association. They think the forests should be protected, but when it comes to taking a drive crew to fight a fire, or to forbidding the drivers to smoke in a dry time, or to discharging a man who is careless about setting a fire, it is extremely difficult to get them to do anything. However, this state of affairs is passing and it is to be hoped that a spirit of full cooperation will soon take the place of such a petty state of mind. Two very important things still block the wheels of progress. The more important of the two is the interference of politics which is shown in two ways. First and least important is the pressure occasionally brought to bear by politicians to have good men of an opposite party removed from their positions as rangers and men of the same party substituted. Fortunately there has been very little of this. The greatest difficulty is the way in which the law is enforced by the judges before whom offenders against the fire laws are tried. The law provides a fine of fifty dollars or three months' in prison for infractions of these, but the judges either dismiss the actions or give such light fines that no good whatever is done. Often members of Parliament interfere on behalf of their constituents and by using their influence obtain light fines. In either case the ef-

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fect is the same, the law is made the laughing stock and fires go on just the same. Of course the education of public opinion will in time remedy this, but it is a pity that those who are charged with the execution of the laws should have so little regard for their oaths and for the good of the country.

The next most important thing which is necessary for fire protection is the better disposal of lumbering slash. Once a fire gets into a cut-over country it is almost impossible to stop it, but if the debris from lumbering were removed there would practically never be serious forest fires in this section. If a general law were passed making it compulsory on all woods operators to burn their debris at the time of logging, little extra expense would be involved, and since every operator would have to use the same measures there would be discrimination and the cost would all fall on the consumer. That such disposal is entirely practical and not at all prohibitory in cost is shown by the experience of Mr. Gutches in Saskatchewan and Forester Cox in Minnesota.

The worst fire in the territory of the St. Maurice Forest Protective Association was on the Croche River on the limits of The Belgo-Canadian Pulp and Paper Co., The Brown Corporation and Mr. J. H. Dansereau. This fire was probably caused by some dam keepers or fox hunters throwing away burning matches used to light their pipes and burnt over about 30 square miles. The section where this fire started had been partly lumbered and the fire gained such headway in the old cuttings that it was impossible to check it and by the time it reached the virgin timber it had gained such headway that nothing but rain could check it.

In Ontario there is no restriction on brush burning or land clearing by fire, so that the settlers are much more of a menace than in Quebec and the same problem of proper and impartial enforcement of the fire laws are necessary.

The tenders are all in for the million and a half dollar storage dam to be built by the Quebec Government on the St. Maurice River, at the rapid La Loutre. This dam is of the first importance to one of the most important industrial sections of the province and by stabilizing the water conditions will be of great benefit.

Dr. B. E. Fernow, dean of the Faculty of Forestry of the University of Toronto, is just starting a trip through the west.

Prof. W. N. Millar, of the University of Toronto, is in Calgary.

Mr. Clyde Leavitt, Forester to the Dominion Railway Commission and presi-

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dent of the Canadian Society of Forest Engineers, will visit Grand Mere shortly to confer with the secretary of the society on its future activities.

The automobile purchased by the St. Maurice Forest Protective Association for one of its rangers has proved a great success.

British Columbia Notes

The Hon. W. R. Ross has received information from the Agent General for British Columbia to the effect that the cargo of 160,000 creosoted Douglas fir ties shipped to India to the order of the Bengal & Northwestern Ry. last fall per the steamship "Queen Helena" have arrived, and have given full satisfaction.

Advices reaching the Minister of Lands concerning the fire situation throughout the province are for the present satisfactory, although the immediate prospects unless rain falls, are rather ominous in certain sections.

During the early part of July rain fell in the Hazelton, Nelson, Cranbrook, Vernon and Kamloops Districts, as well as in the eastern section of the Fort George Division, followed, however, by clear, warm weather, with resulting increase in the fire hazard. In the Tete Jaune District, conditions are reported as being reasonably safe, in view of the hot, dry, windy weather.

The prevailing heat, accompanied by a clear atmosphere and wind, with resultant drying out of vegetation, has been responsible for several fires in the coast districts, outbreaks being reported at North Vancouver, Langley, Delta, Cheakamus, Half Moon Bay, Texada Island, Toba Inlet, Thurlow Island, Green Point Rapids, and Loughboro Inlet, the area burned over being approximately 1,000 acres, principally slashings, and the damage to merchantable timber fortunately small.

Four fires, all under control, have occurred in the island district, two of which were at Parksville, and a third at Courtenay.

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Current Literature

MONTHLY LIST FOR JULY, 1915

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Tenders for Pulpwood Limit

TENDERS will be received by the undersigned up to and including Wednesday, the fifteenth day of September 1915, for the right to cut pulpwood on a certain area situated north of the Transcontinental Railway, west of Lac Seul and south of English River in the District of Kenora.

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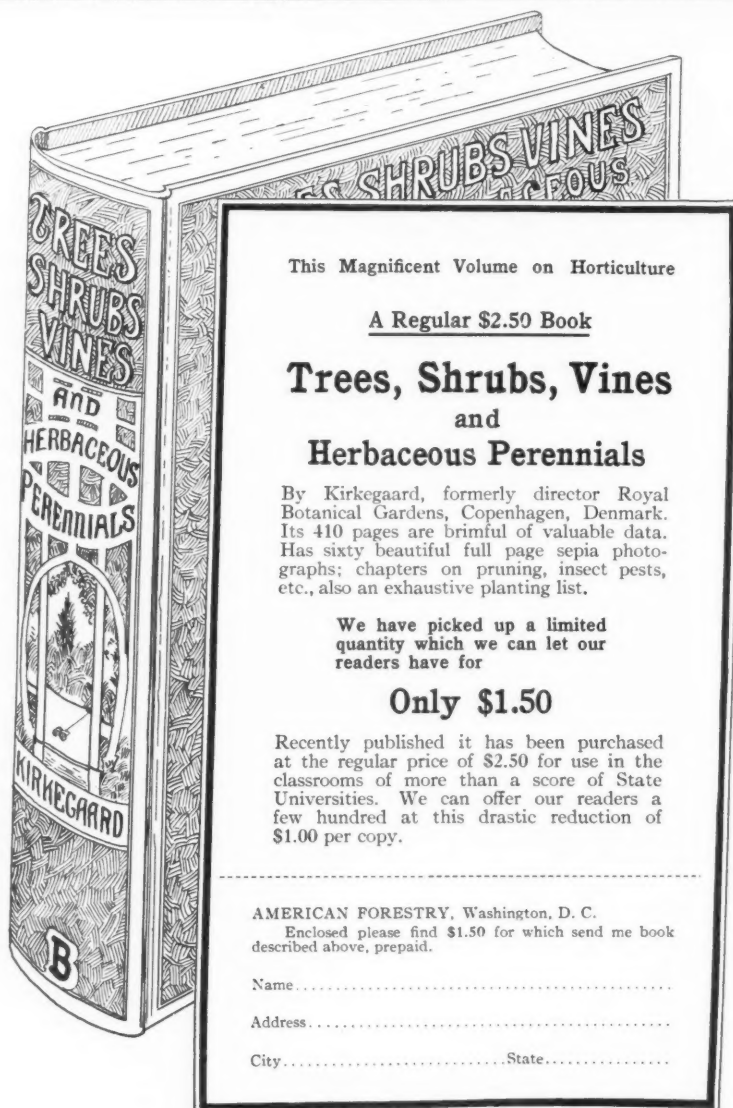
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